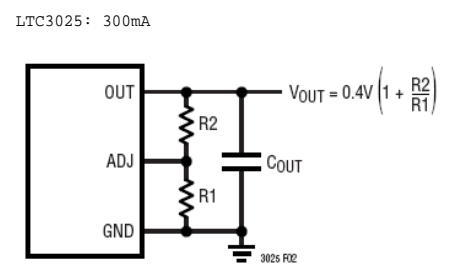
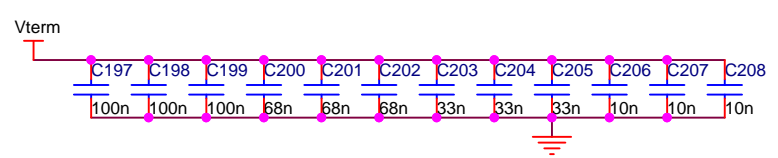
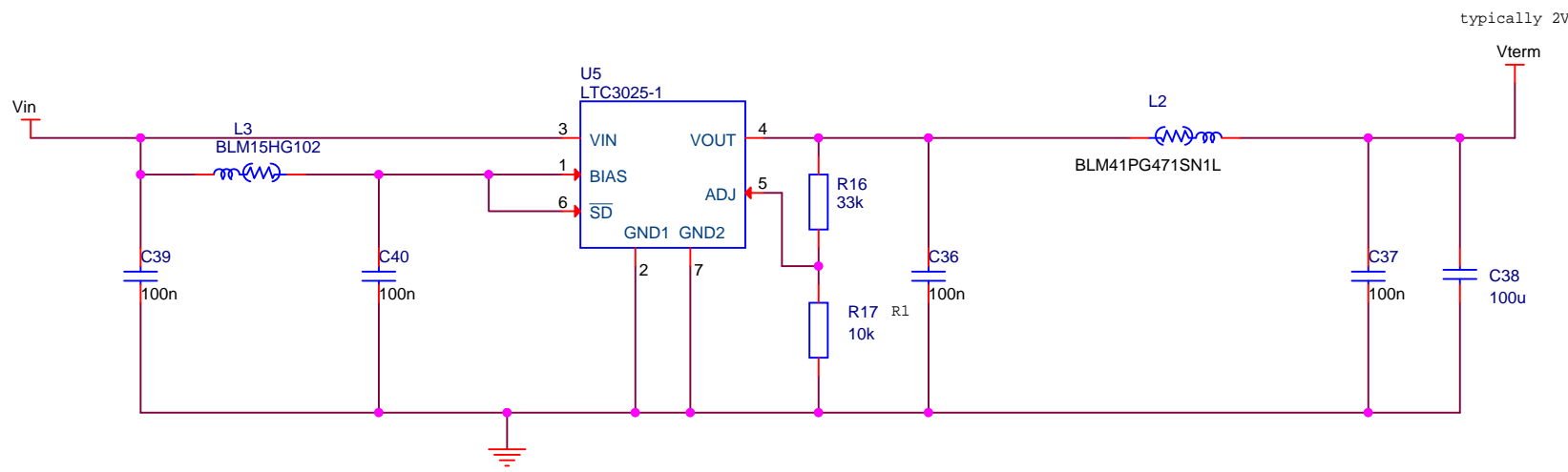
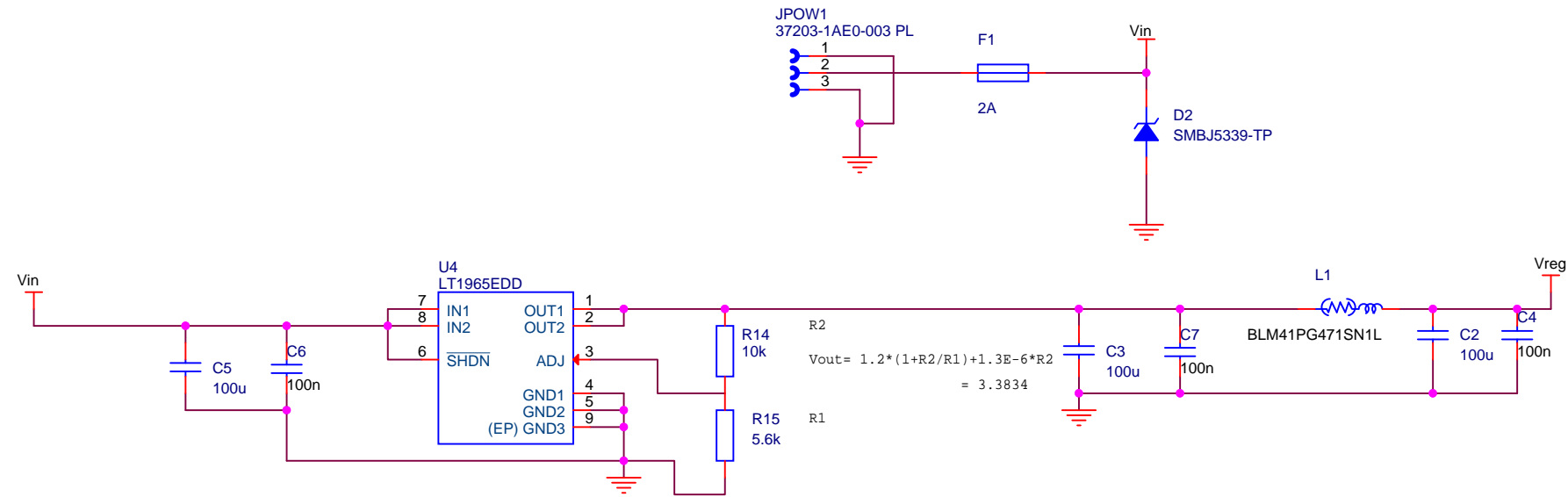
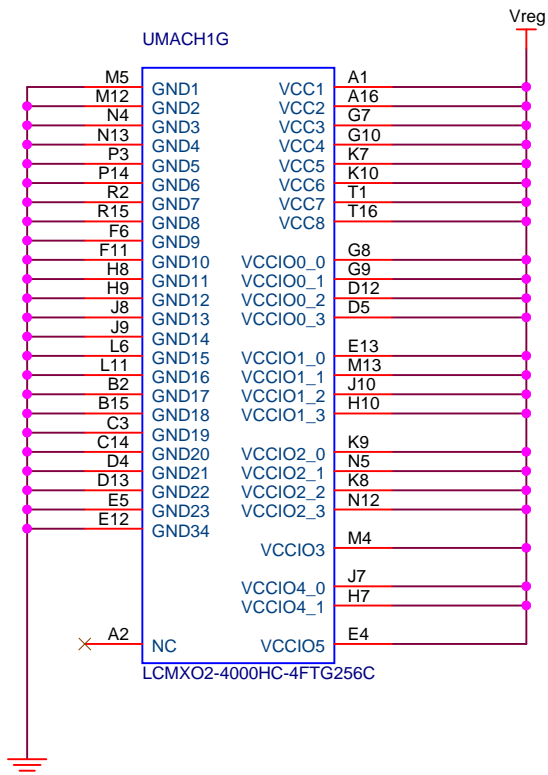


**GSIC** Gesellschaft für Schwerionenforschung mbH  
 Planckstrasse 1  
 D-64291 Darmstadt  
 GERMANY  
 www.gsi.de

**01\_ERNI-Connector**

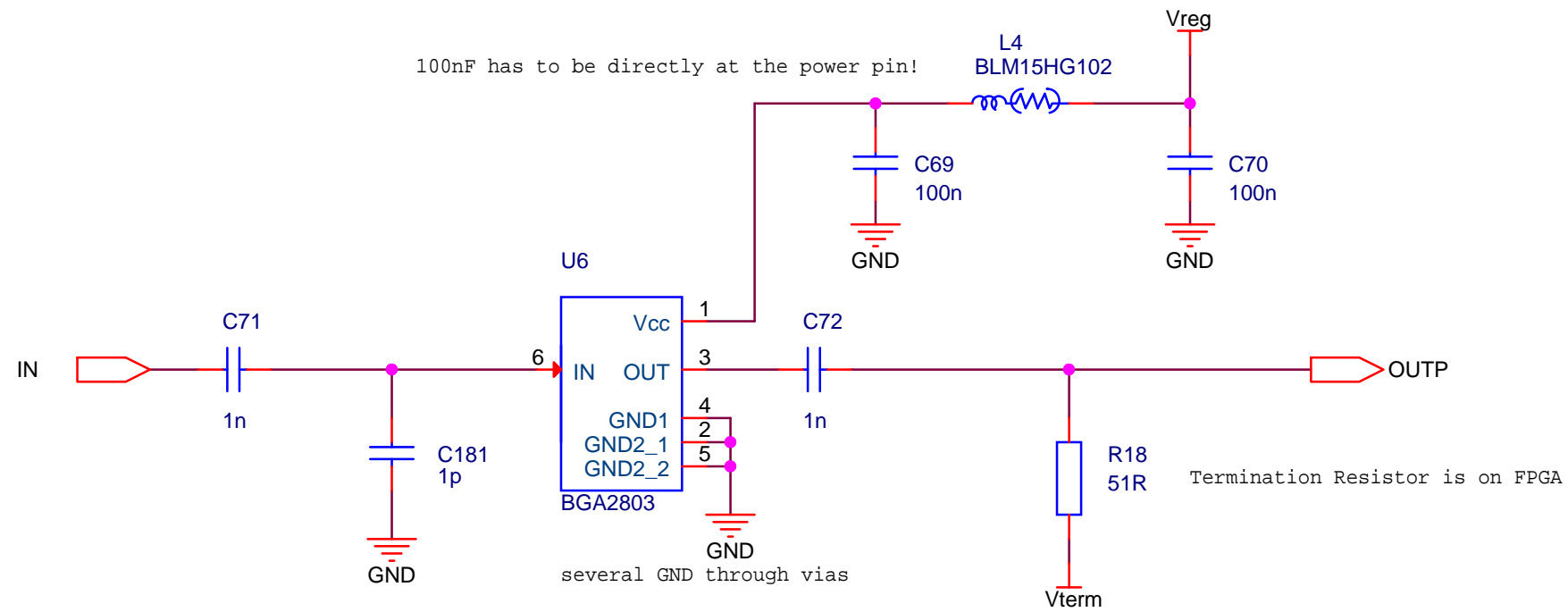




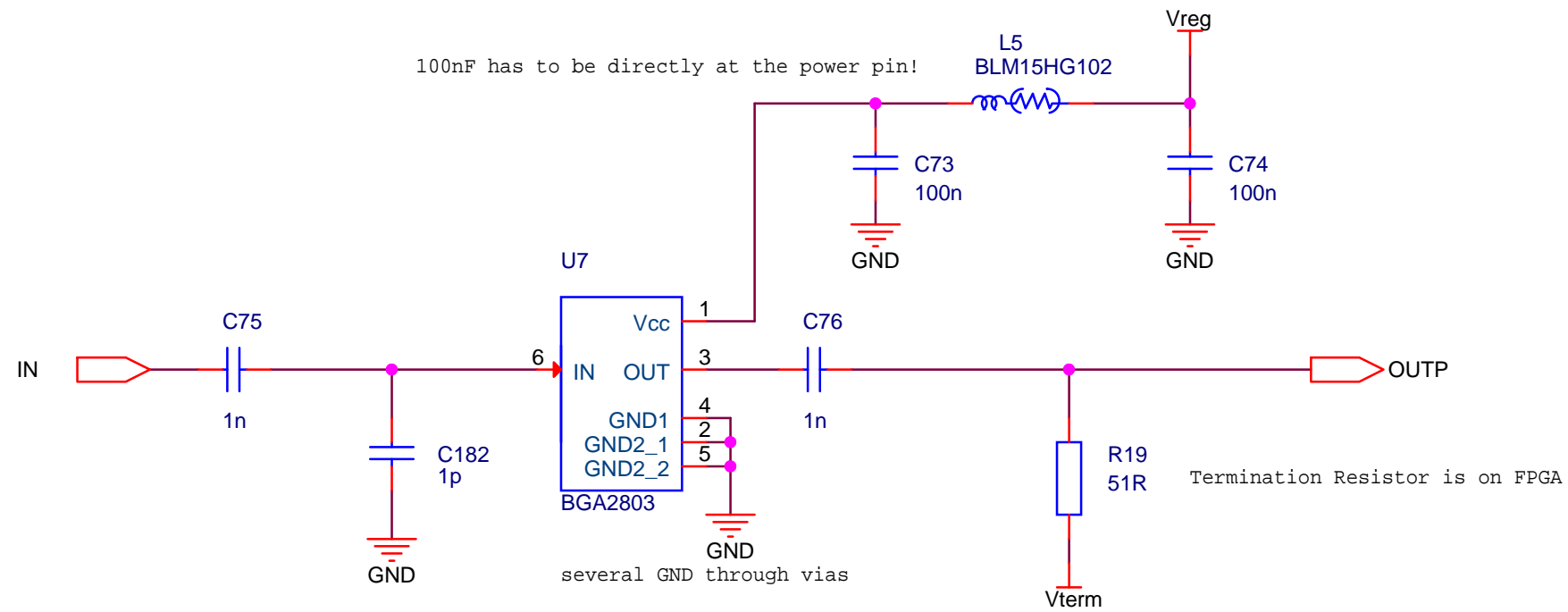
**GSI** Gesellschaft für Schwerionenforschung mbH  
 Planckstrasse 1  
 D-64291 Darmstadt  
 GERMANY  
 www.gsi.de

**03\_FPGA-Power**

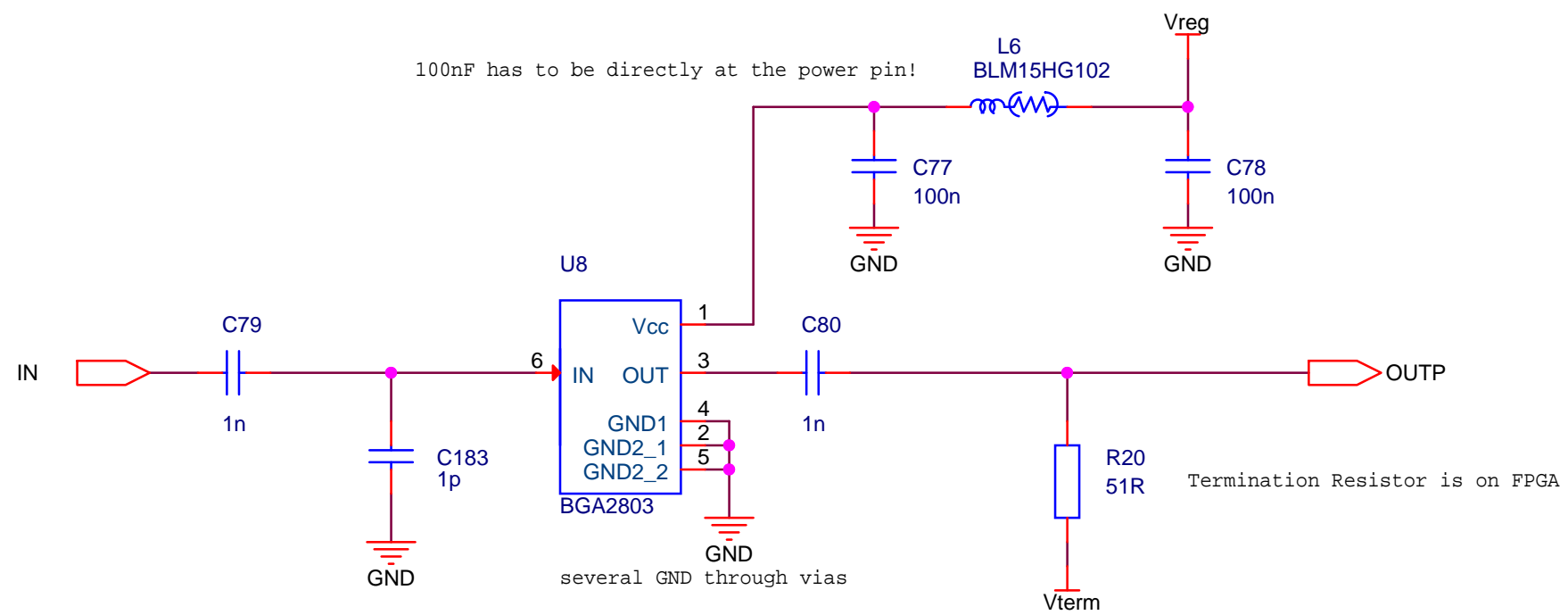
Design: K:\GSI\JOB\COME\_AND\_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA  
 Modified: Monday, December 10, 2012 Size: A3 Page: 3 / 35  
 Designer: M.Traxler Layouter: S.Voltz



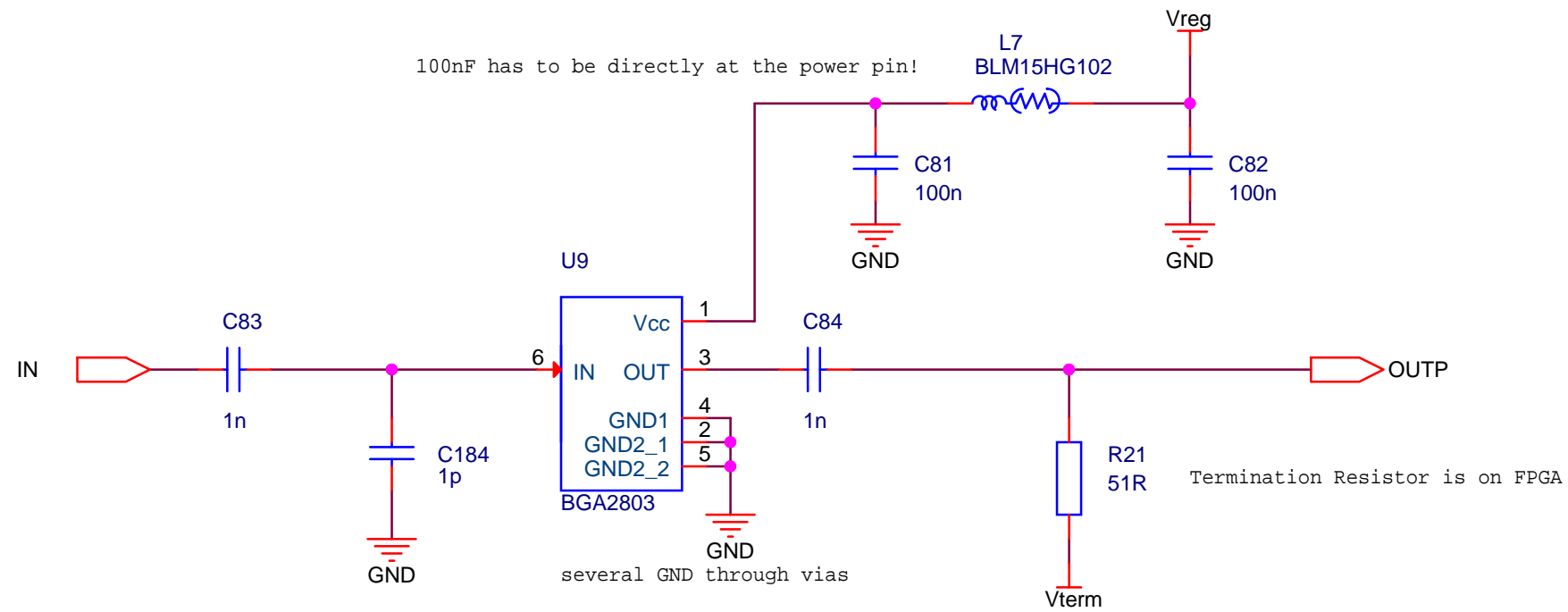
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4 Page: 4 / 35
Designer: M.Traxler		Layouter: S.Voltz



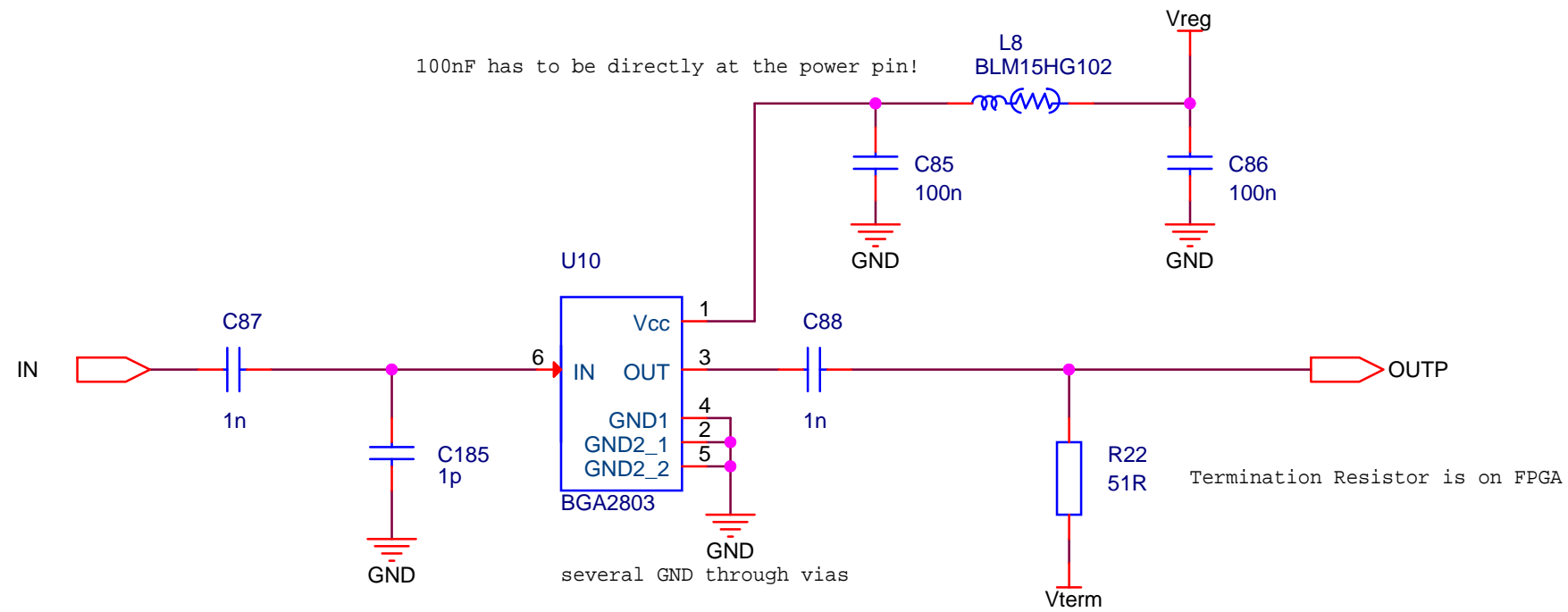
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4
Designer: M.Traxler		Page: 5 / 35 Layouter: S.Voltz



	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4      Page: 6 / 35
Designer: M.Traxler		Layouter: S.Voltz

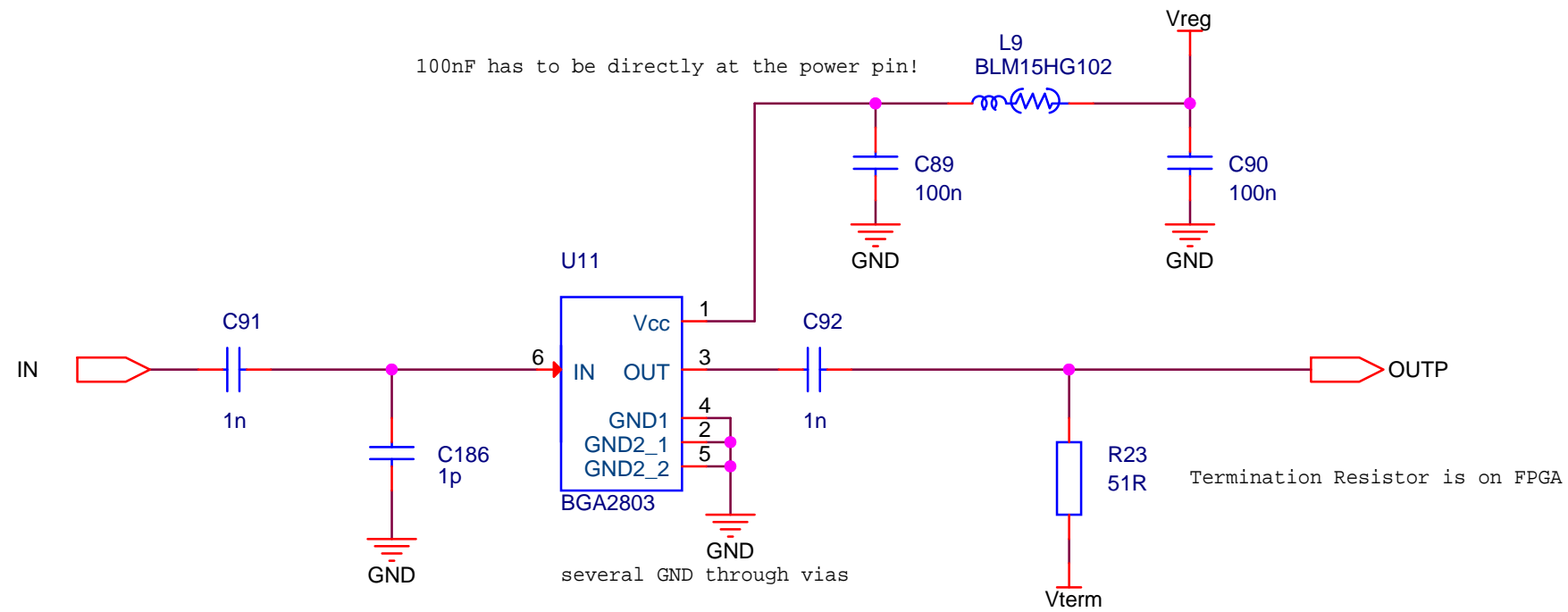


	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4      Page: 7 / 35
Designer: M.Traxler		Layouter: S.Voltz

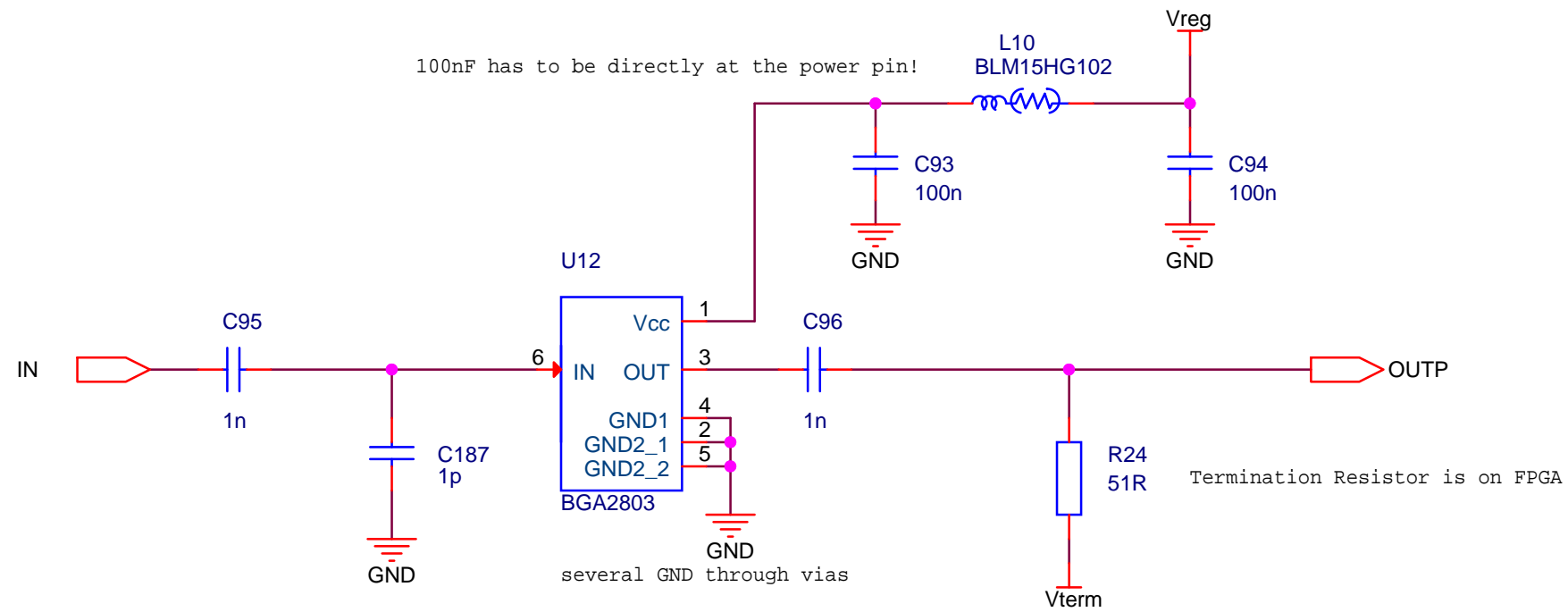


	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		Modified: Monday, December 10, 2012
Designer: M.Traxler		Size: A4 Page: 8 / 35 Layouter: S.Voltz

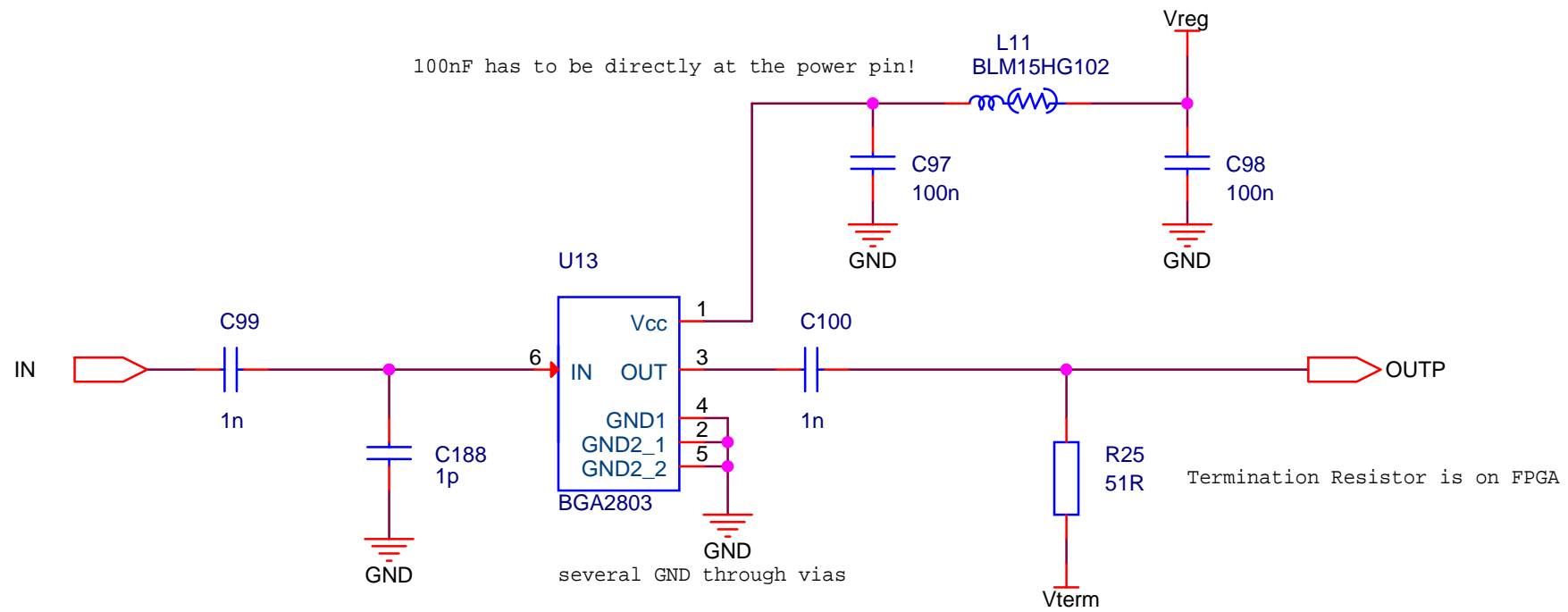




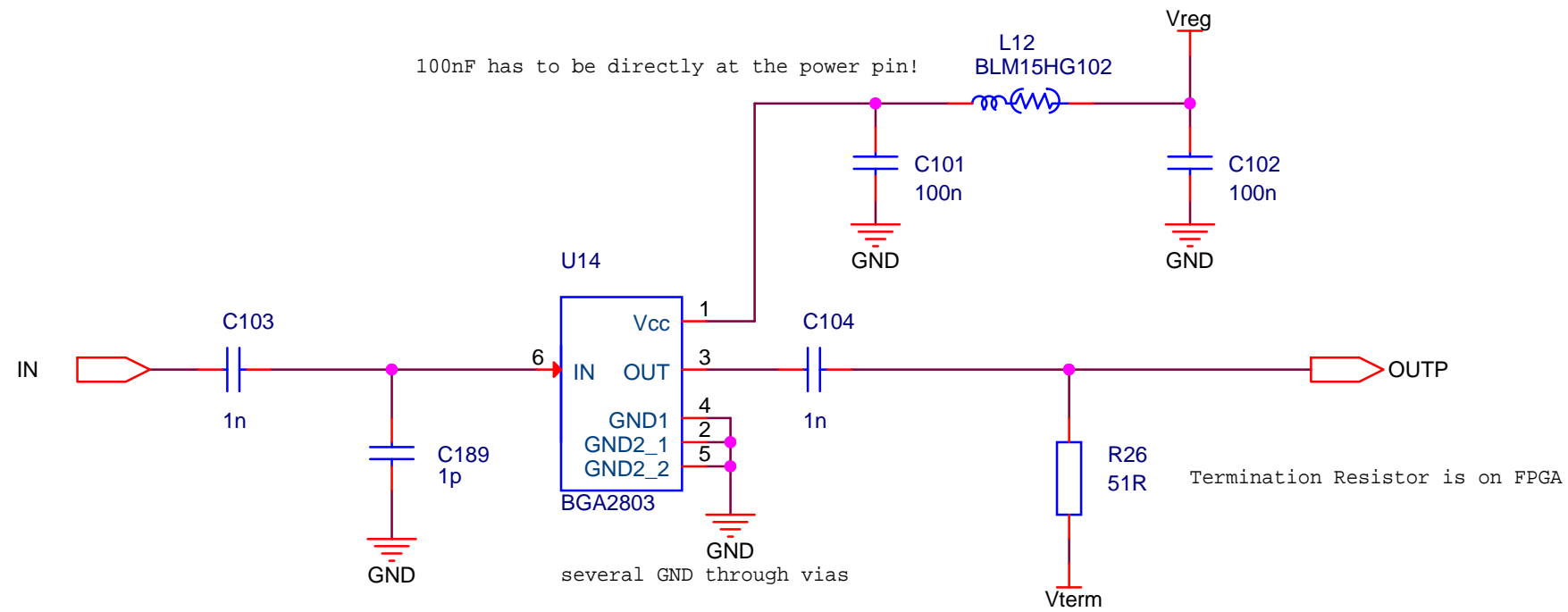
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		Modified: Monday, December 10, 2012
Designer: M.Traxler		Size: A4 Page: 9 / 35 Layouter: S.Voltz



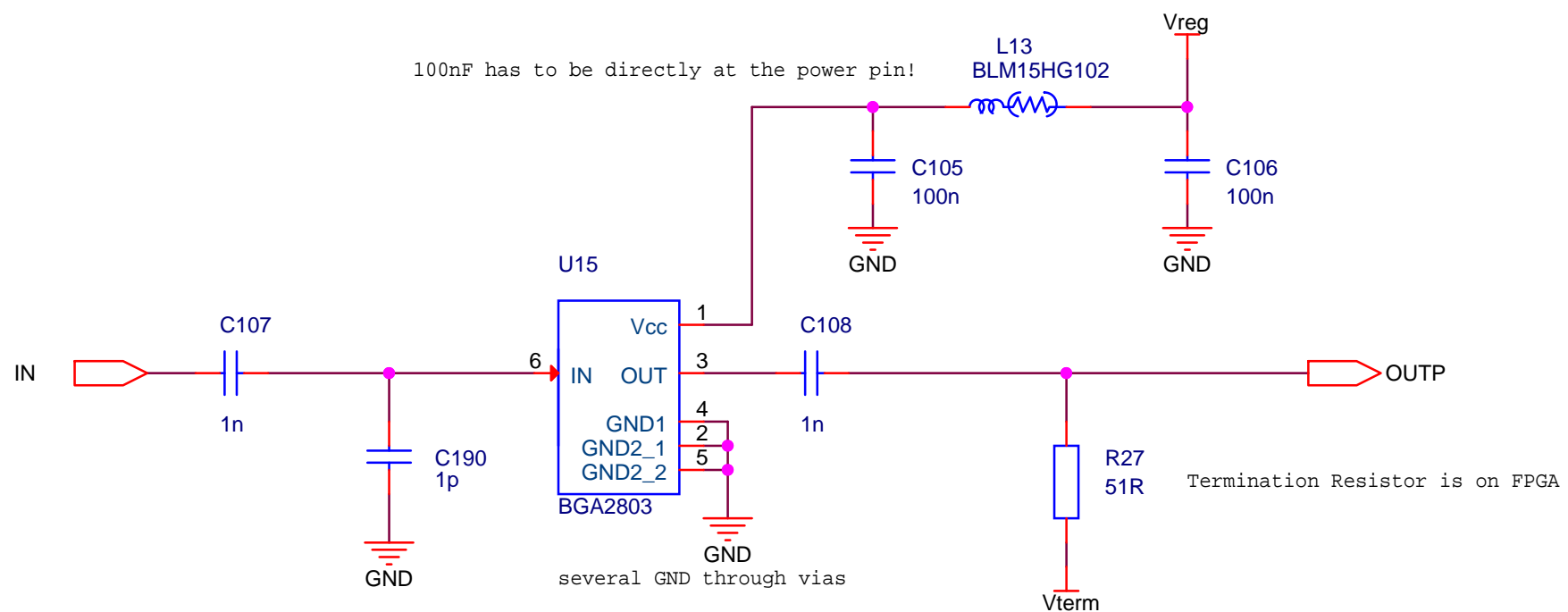
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		Modified: Monday, December 10, 2012
Designer: M.Traxler		Size: A4 Page: 10/ 35 Layouter: S.Voltz



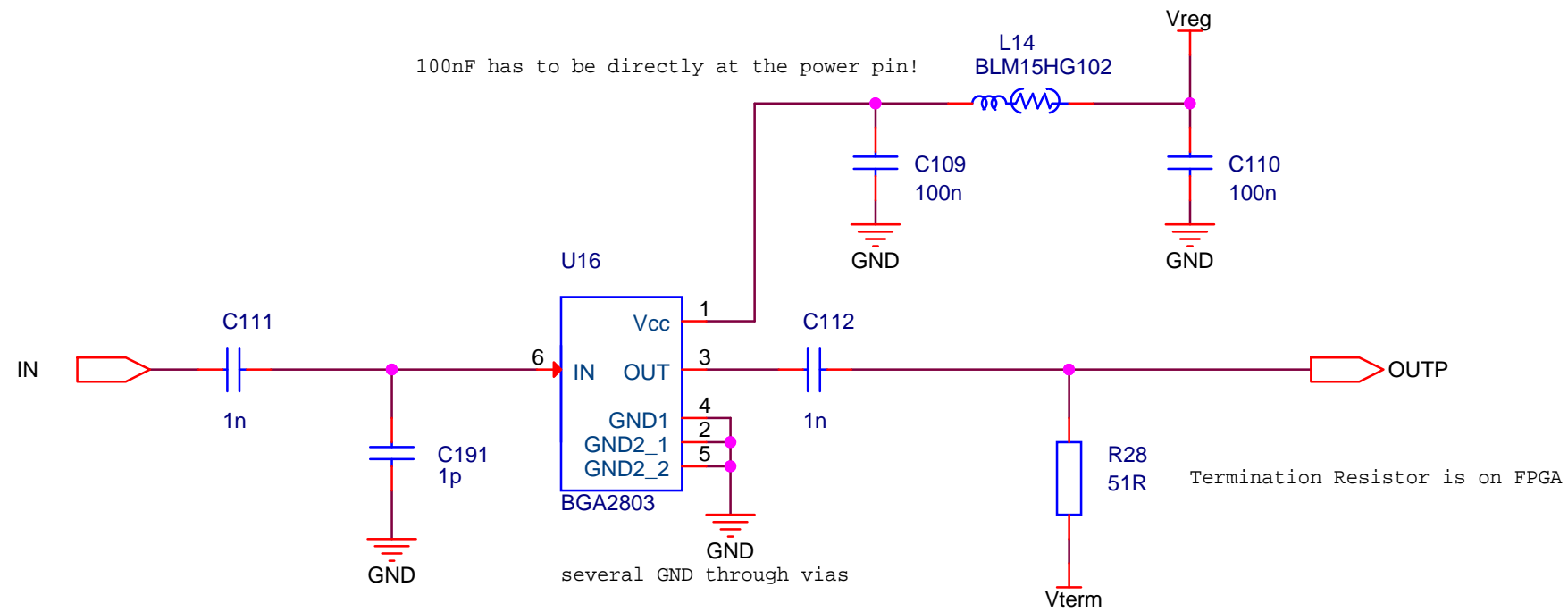
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4 Page: 11/ 35
Designer: M.Traxler		Layouter: S.Voltz

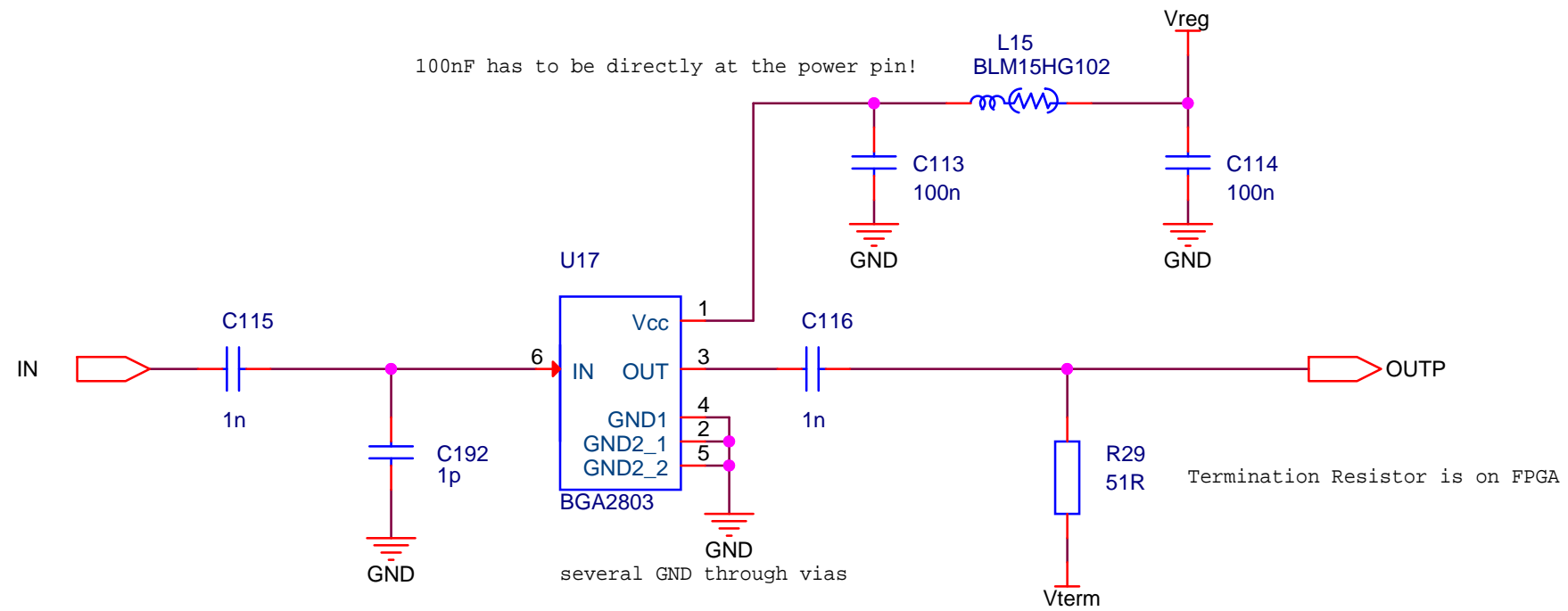


	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4 Page: 12/ 35
Designer: M.Traxler		Layouter: S.Voltz

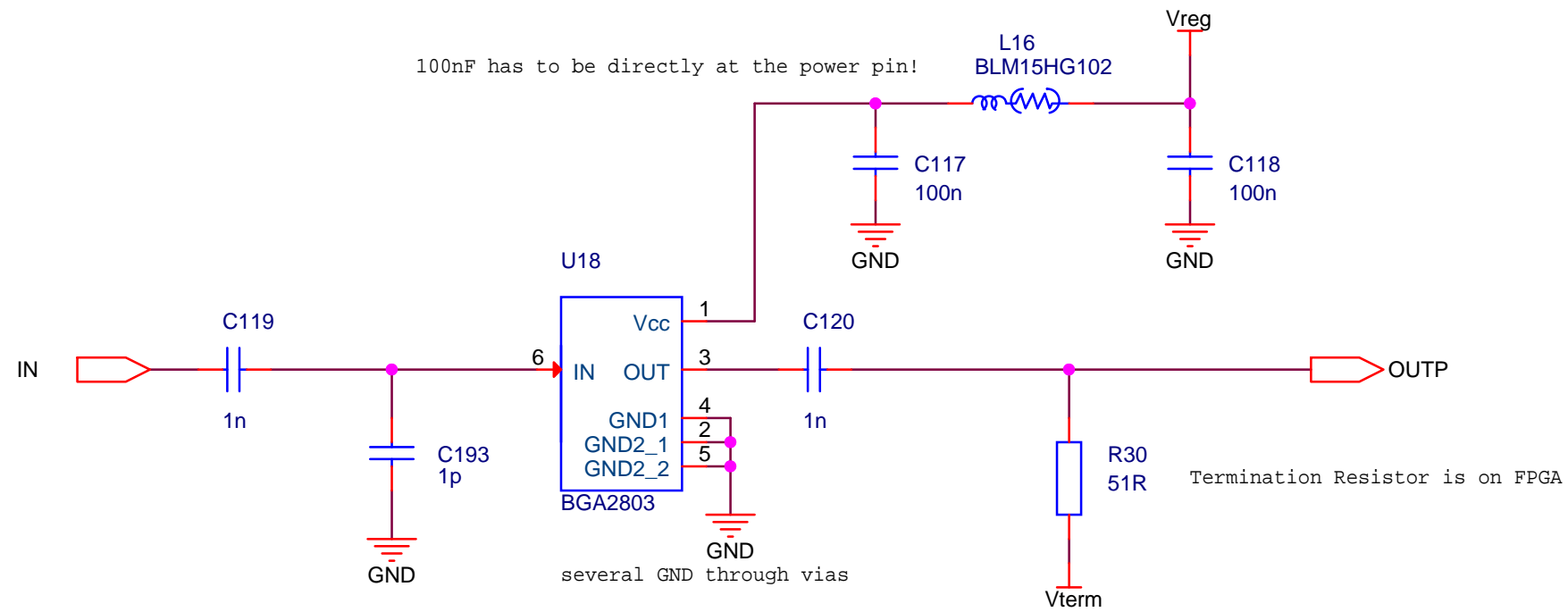


		Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
		<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		Modified: Monday, December 10, 2012	
Designer: M.Traxler		Size: A4 Page: 13/ 35 Layouter: S.Voltz	



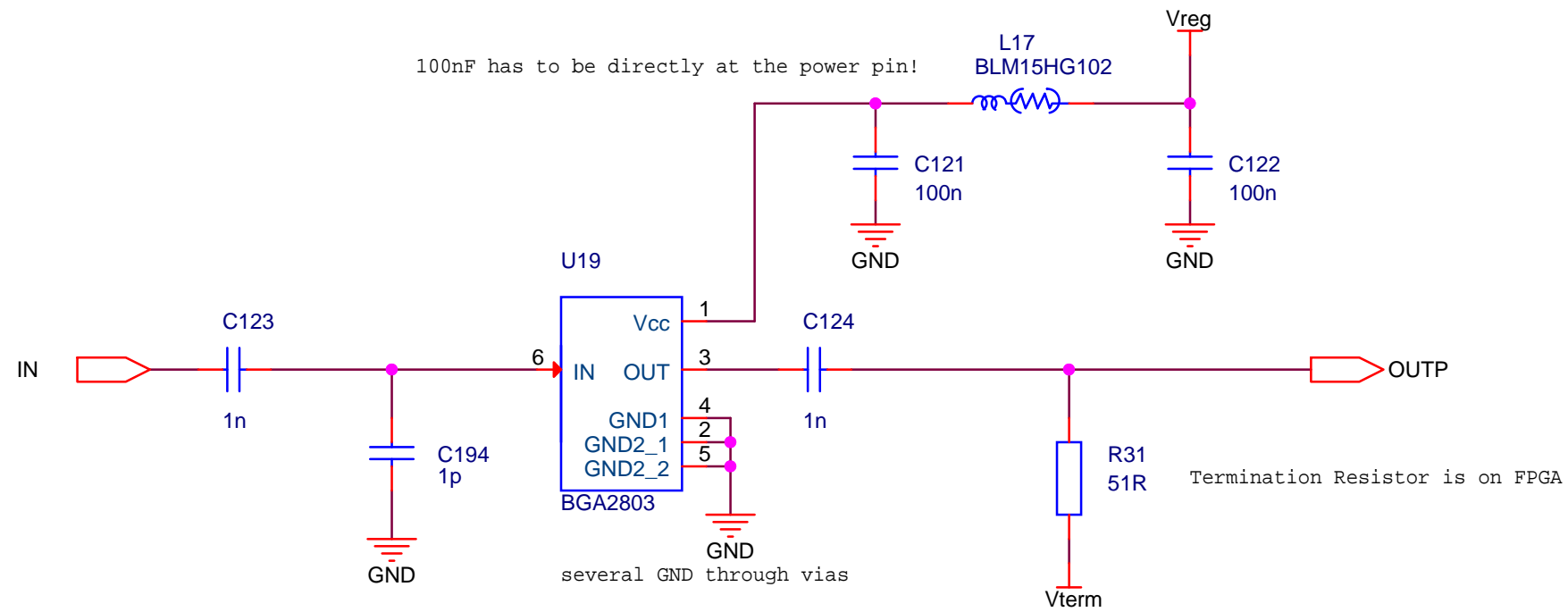


	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4 Page: 15/ 35
Designer: M.Traxler		Layouter: S.Voltz

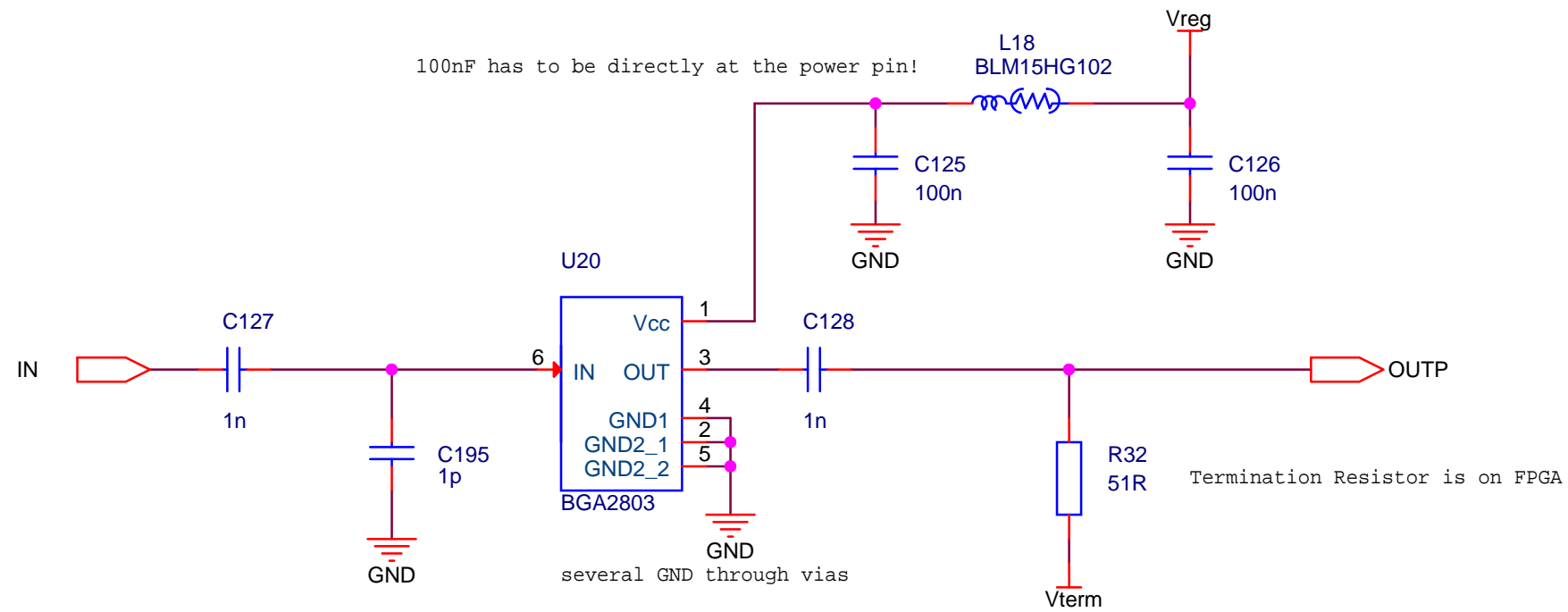


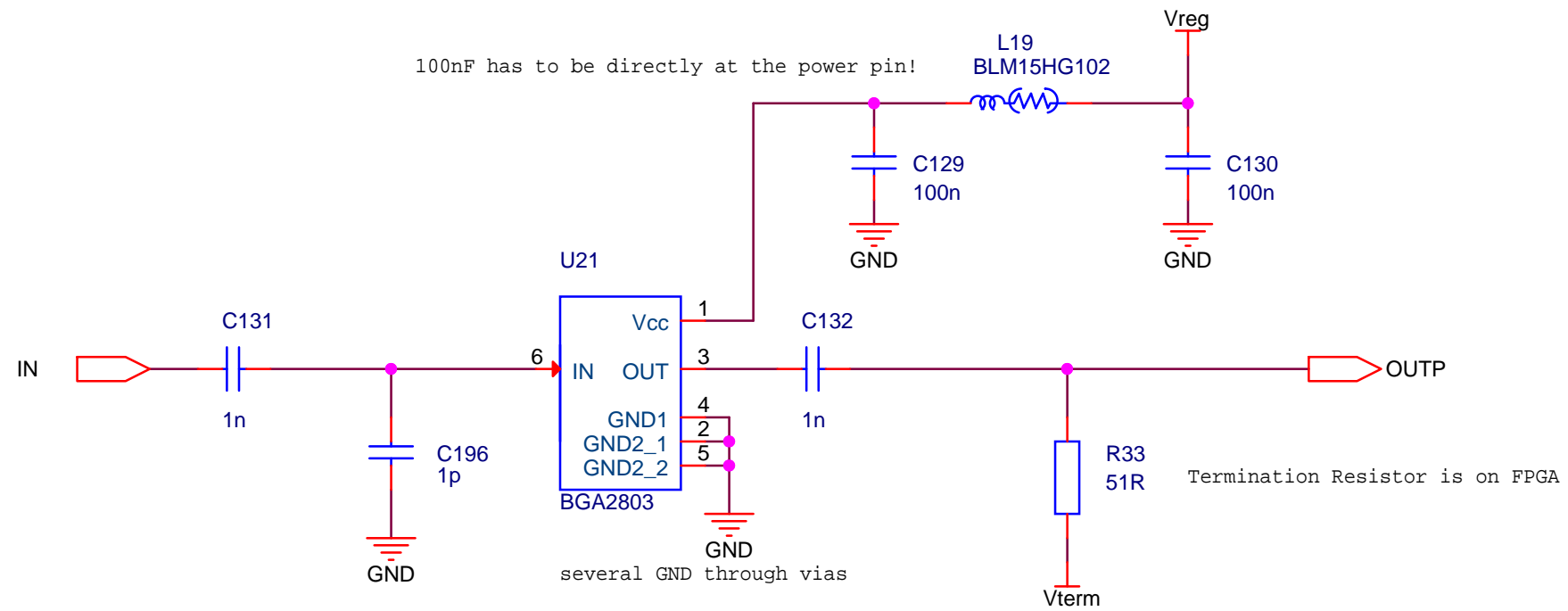
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4 Page: 16/ 35
Designer: M.Traxler		Layouter: S.Voltz



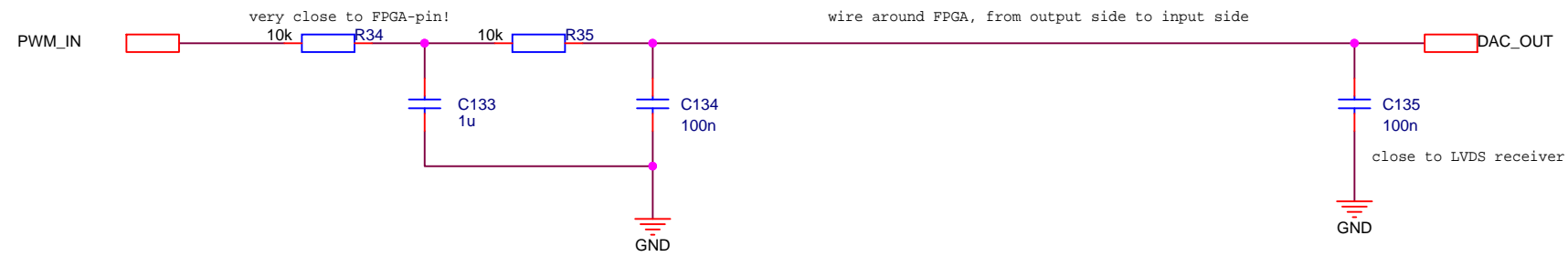


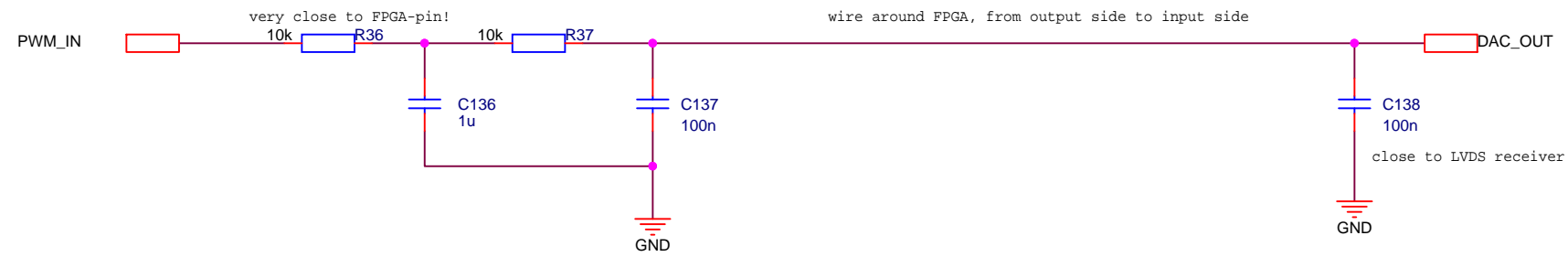
	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		Modified: Monday, December 10, 2012
Designer: M.Traxler		Size: A4 Page: 17 / 35 Layouter: S.Voltz



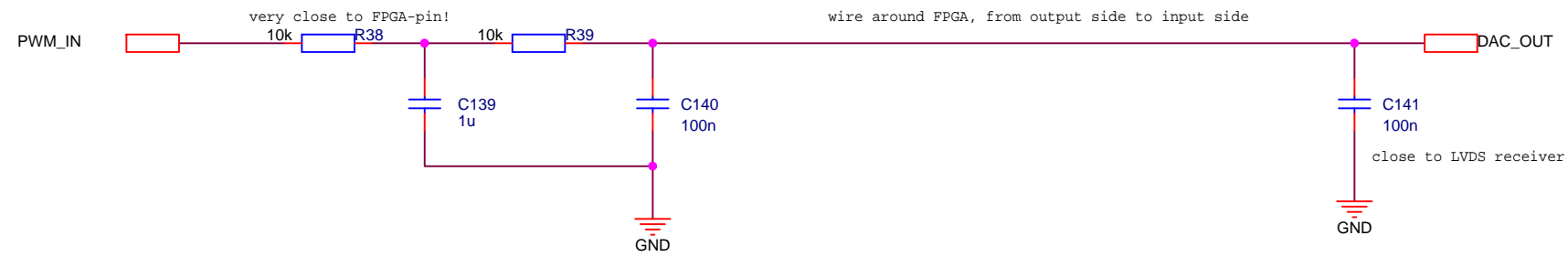


	Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
	<b>Channel_P</b>	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA.MP		
Modified: Monday, December 10, 2012		Size: A4
Designer: M.Traxler		Page: 19/ 35
Designer: M.Traxler		Layouter: S.Voltz

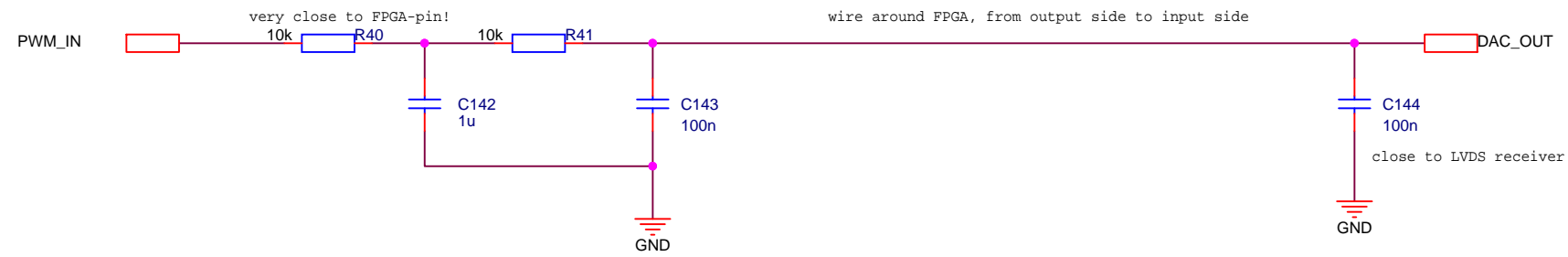


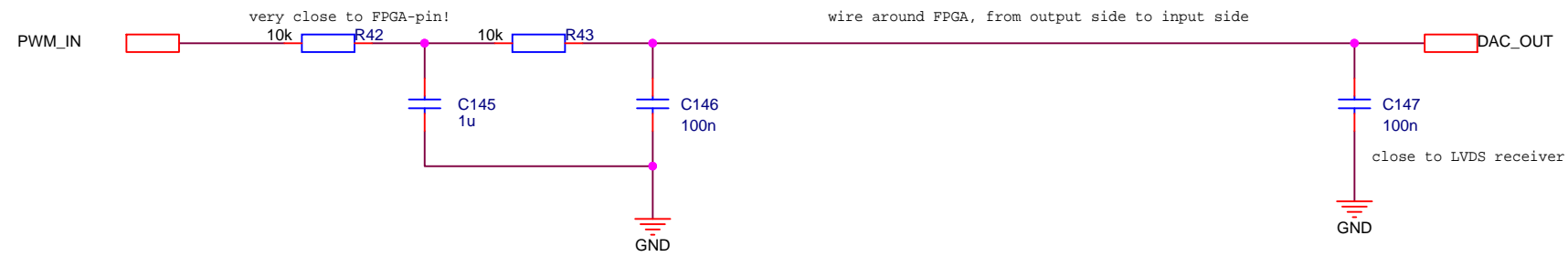


		Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
		<b>DAC</b>	
Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA		Modified: Monday, December 10, 2012	
Designer: M. Traxler		Size: A3	
Designer: M. Traxler		Page: 21/ 35	
Designer: M. Traxler		Layouter: S. Voltz	



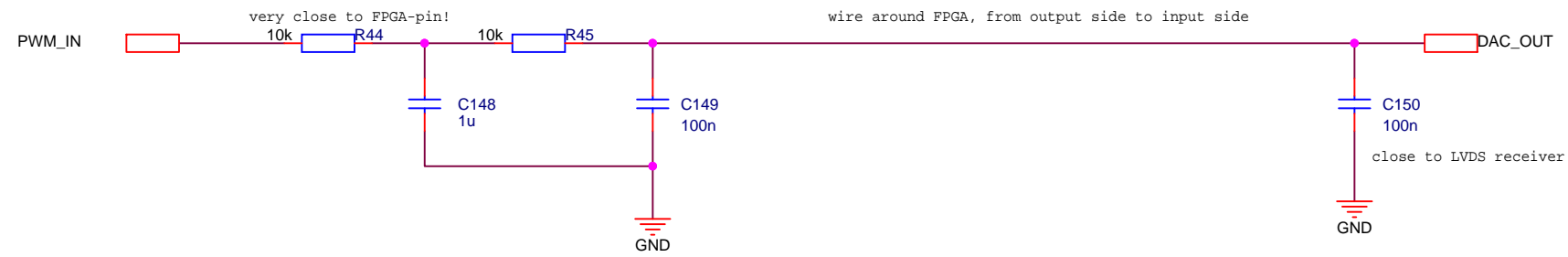
 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
Designer: M. Traxler		Layouter: S. Voltz	



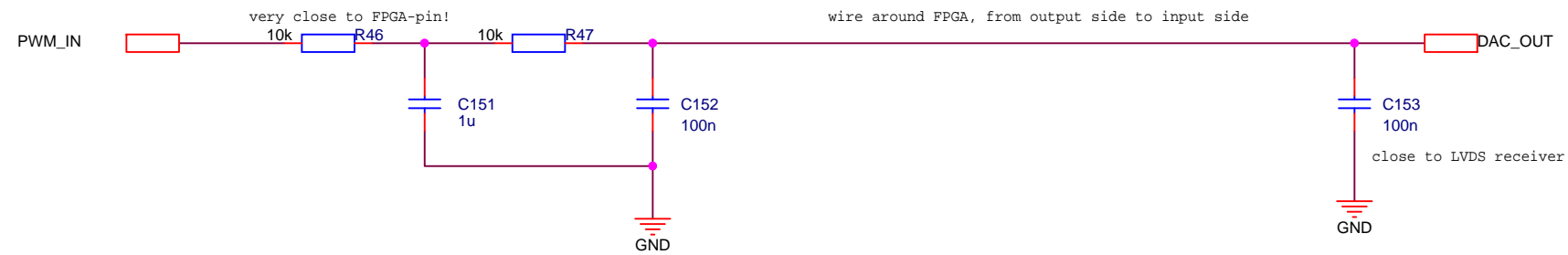


 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
Designer: M. Traxler		Layouter: S. Voltz	

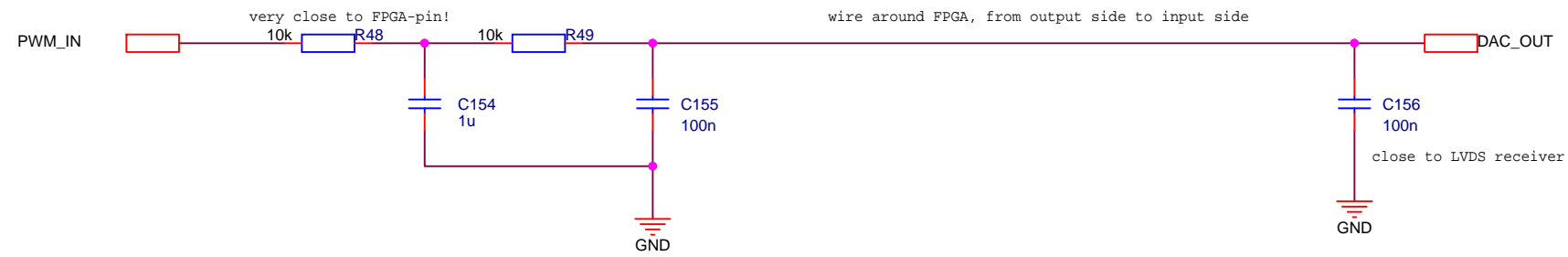




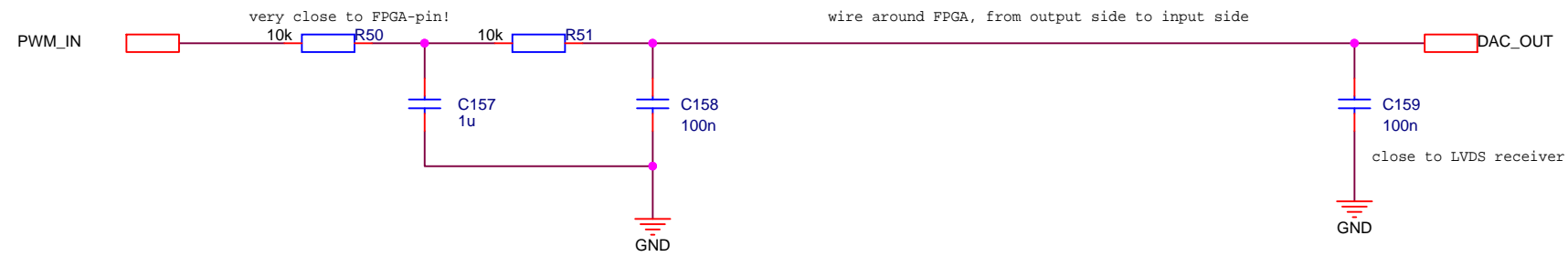
		Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
		<b>DAC</b>	
Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA		Modified: Monday, December 10, 2012	
Designer: M. Traxler		Size: A3	
Designer: M. Traxler		Page: 25/ 35	
Designer: M. Traxler		Layouter: S. Voltz	



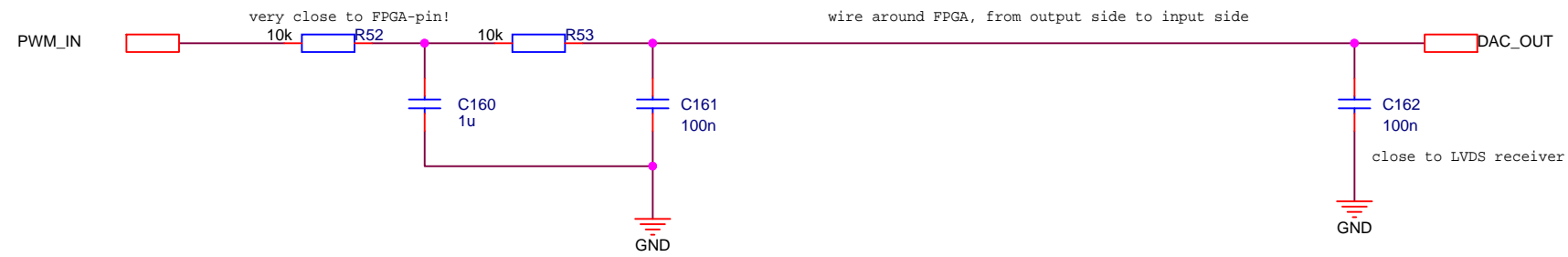
 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
		Designer: M. Traxler	Layouter: S. Voltz



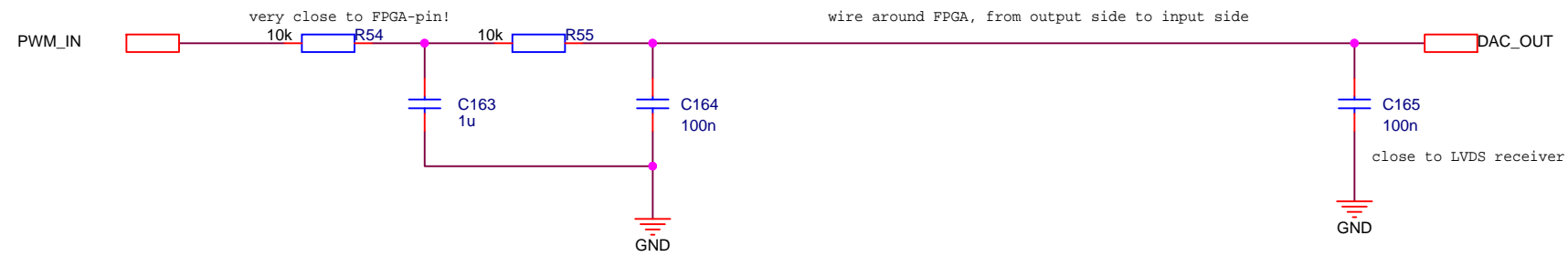
		Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
		<b>DAC</b>	
Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA		Size: A3	Page: 27 / 35
Modified: Monday, December 10, 2012		Designer: M. Traxler      Layouter: S. Voltz	



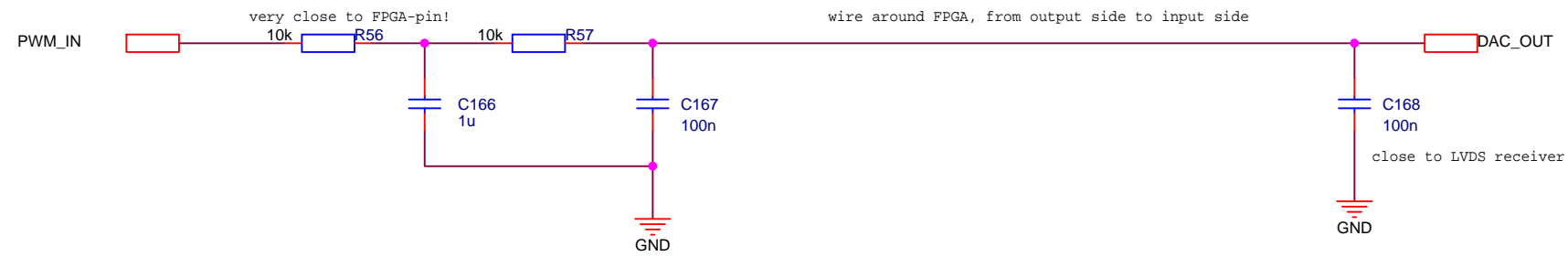
 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	
		Modified: Monday, December 10, 2012	Size: A3
Designer: M. Traxler		Layouter: S. Voltz	



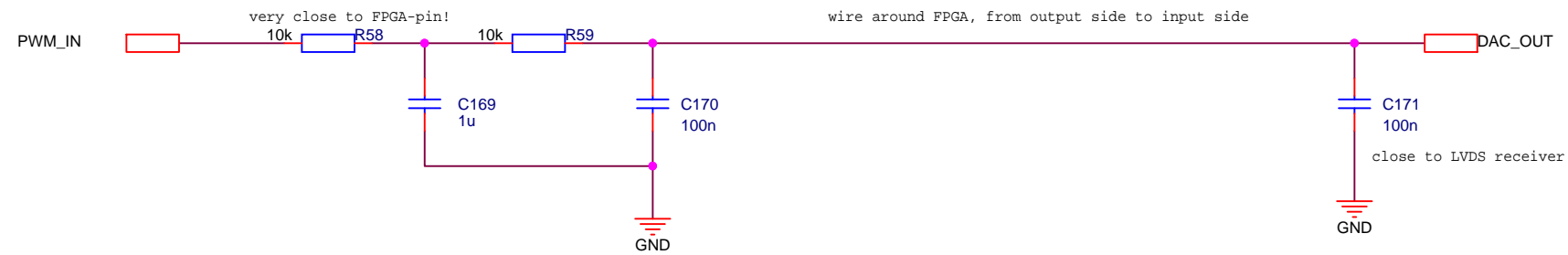
		Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>	
		<b>DAC</b>	
Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA		Modified: Monday, December 10, 2012	
Designer: M. Traxler		Size: A3 Page: 29 / 35 Layouter: S. Voltz	



 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Size: A3
Modified: Monday, December 10, 2012		Designer: M. Traxler	
Designer: M. Traxler		Layouter: S. Voltz	

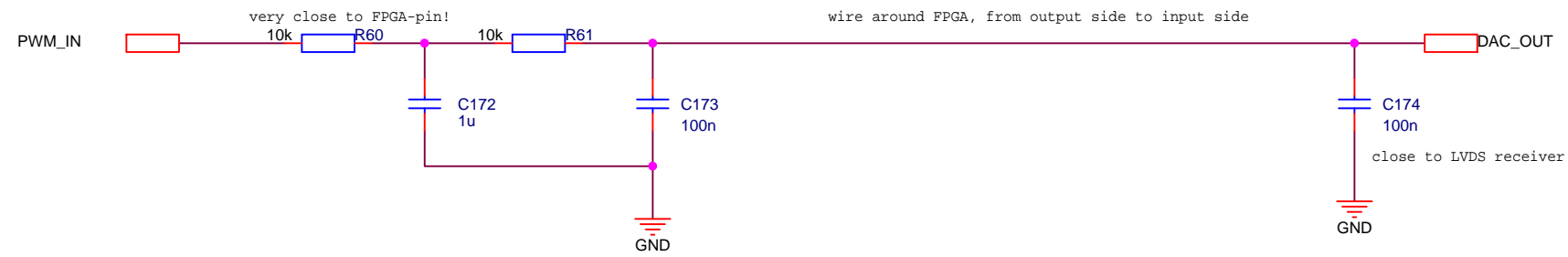


 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
Designer: M. Traxler		Layouter: S. Voltz	

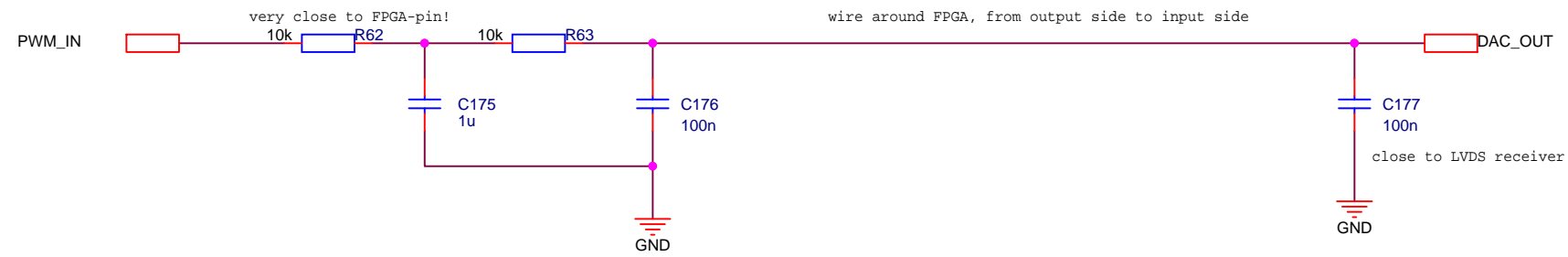


 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
Designer: M. Traxler		Layouter: S. Voltz	

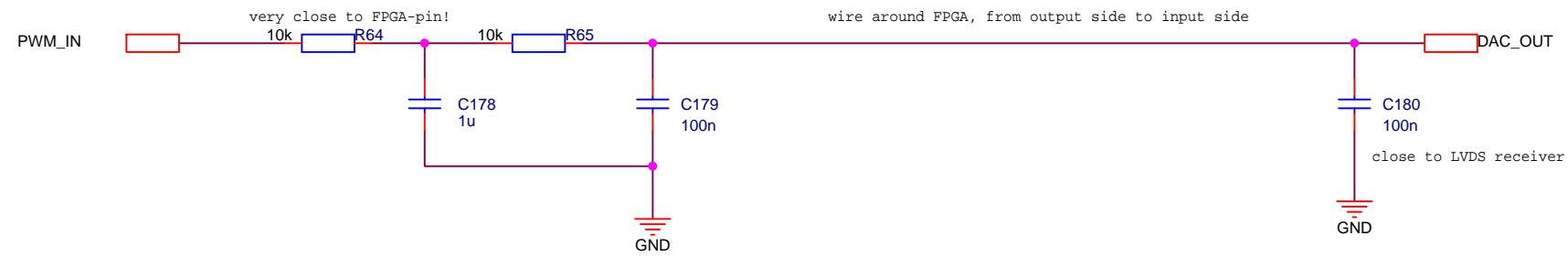




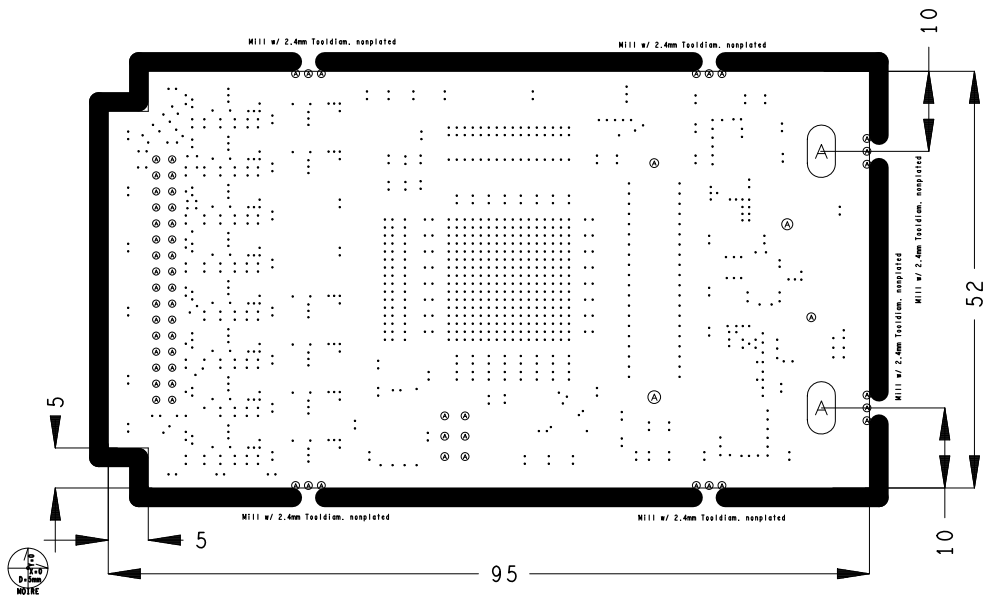
 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		DAC	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Size: A3
Modified: Monday, December 10, 2012		Designer: M. Traxler	
Designer: M. Traxler		Layouter: S. Voltz	



 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		
		<b>DAC</b>
Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Size: A3	Page: 34/ 35
Modified: Monday, December 10, 2012	Designer: M. Traxler	Layouter: S. Voltz



 Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY <a href="http://www.gsi.de">www.gsi.de</a>		<b>DAC</b>	
		Design: K:\GSI\JOB\COME AND KISS\PANDA-DIRC-WASA\PANDA-DIRC-WASA	Modified: Monday, December 10, 2012
Designer: M. Traxler		Layouter: S. Voltz	



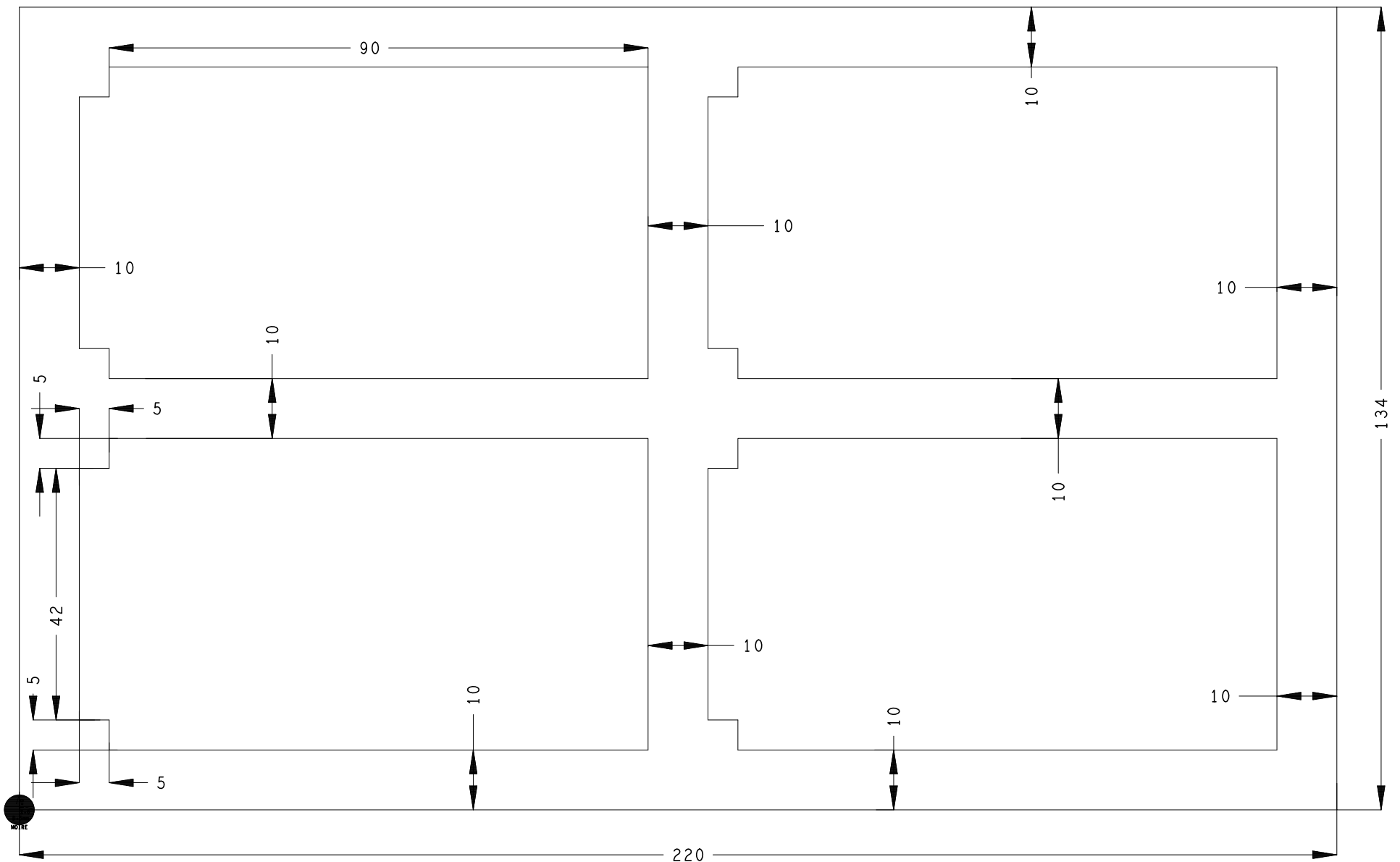
DRILL CHART: TOP to BOTTOM			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
.	0.2	PLATED	1008
.	0.4	PLATED	1
⊙	0.9	PLATED	32
⊙	1.0	PLATED	6
⊙	1.0	NON-PLATED	18
⊙	1.1	NON-PLATED	2
⊙	1.4	NON-PLATED	1
⊙	1.6	NON-PLATED	1
⊙	2.4	NON-PLATED	12
(A)	6.5 x 3.5	NON-PLATED	2

TOTAL HOLES: 1083

Jobname PADIWA3 Date 12.2012 Designer M.Traxler Layouter S.Voltz

Layer Nickname

Drd



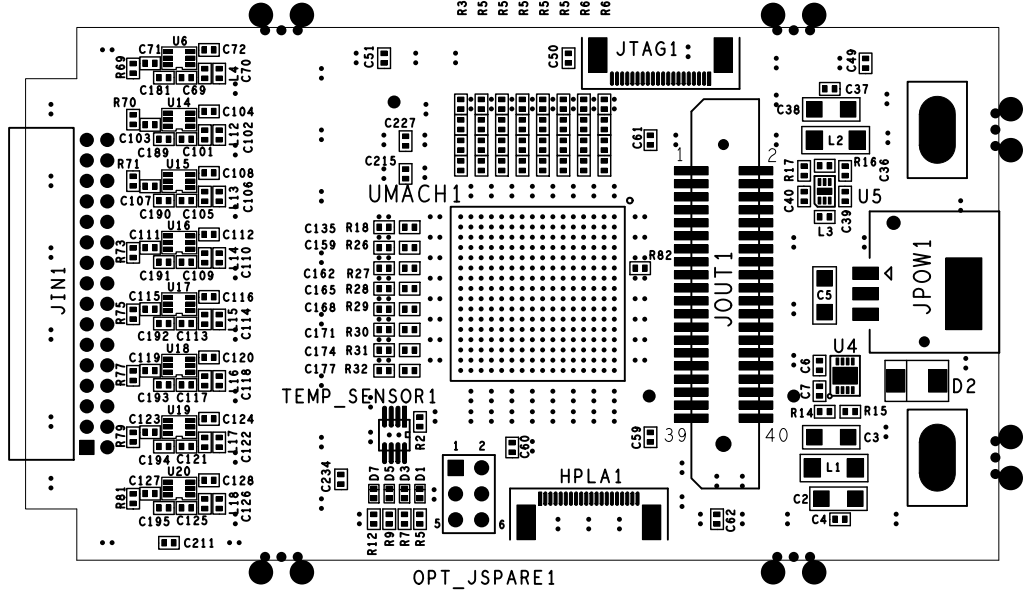
Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname

Fab

GSI-Da  
 PADIWA3  
 MT/SV/12.2012 AST

R34 C133 R35 C134  
 R50 C157 R51 C158  
 R52 C160 R53 C161  
 R54 C163 R55 C164  
 R56 C166 R57 C167  
 R58 C169 R59 C170  
 R60 C172 R61 C173  
 R62 C175 R63 C176

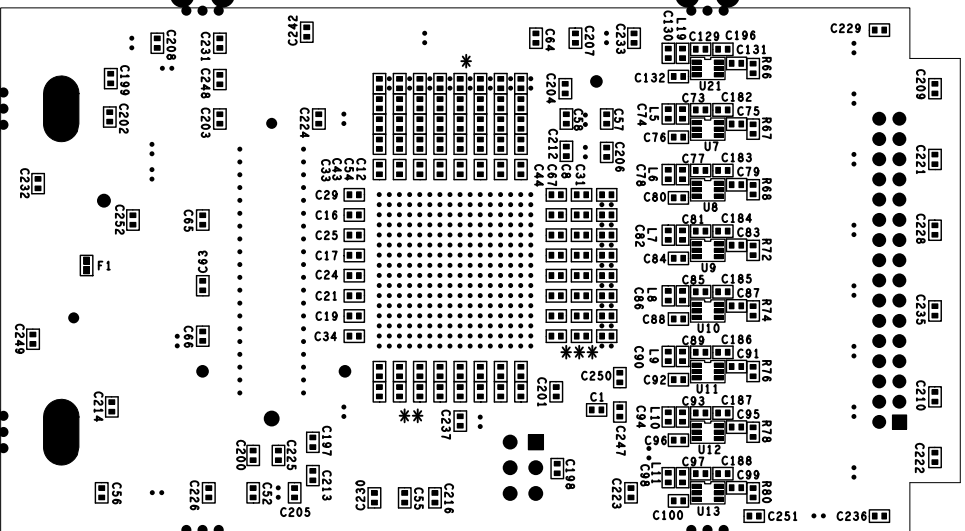


Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname

Ast

\*\*\*  
 C28 R33 C180  
 C18 R19 C138  
 C23 R20 C141  
 C68 R21 C144  
 C22 R22 C147  
 C53 R23 C150  
 C15 R24 C153  
 C27 R25 C156



\*  
 C179 R65 C178 R64  
 C137 R37 C136 R36  
 C140 R39 C139 R38  
 C143 R41 C142 R40  
 C146 R43 C145 R42  
 C149 R45 C148 R44  
 C152 R47 C151 R46  
 C155 R49 C154 R48

GSI-Darmstadt  
 PADIWA3  
 MT/SV/12.2012 ASB

эмвнжкчнпч 79урдл

Jobname  
 PADIWA3

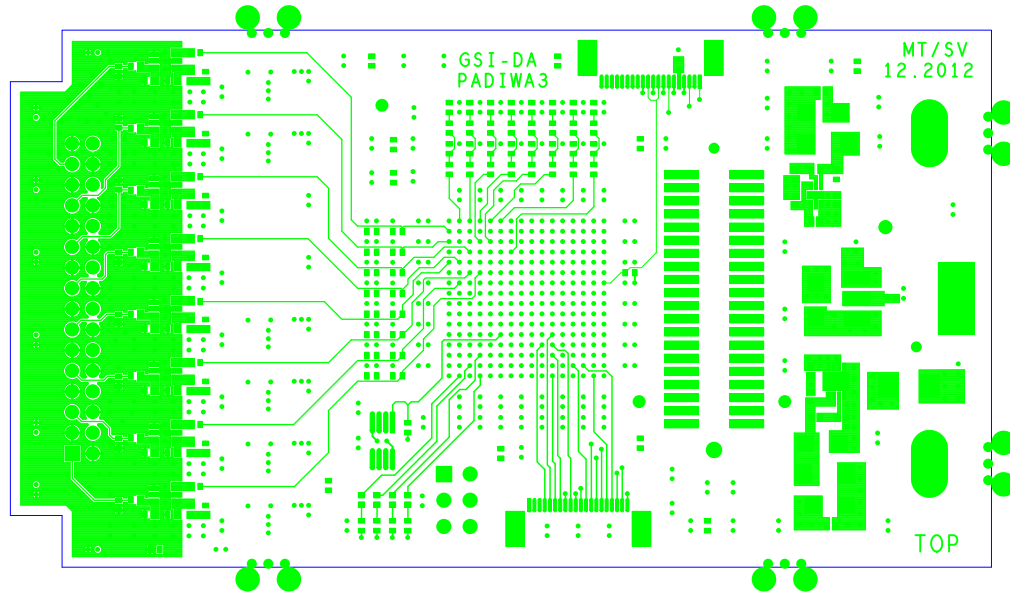
Asp

Date  
 15.10.15

Designer  
 M.Traxler

Layouter  
 S.Voltz

# Signals

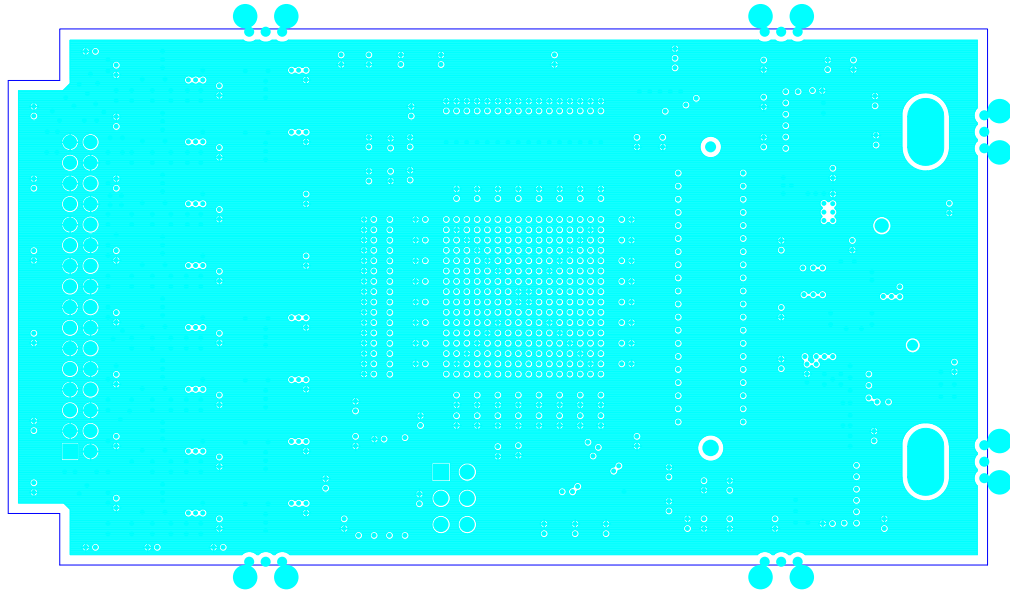


Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname Top



# GND-Plane



Jobname  
PADIWA3

Date  
12.2012

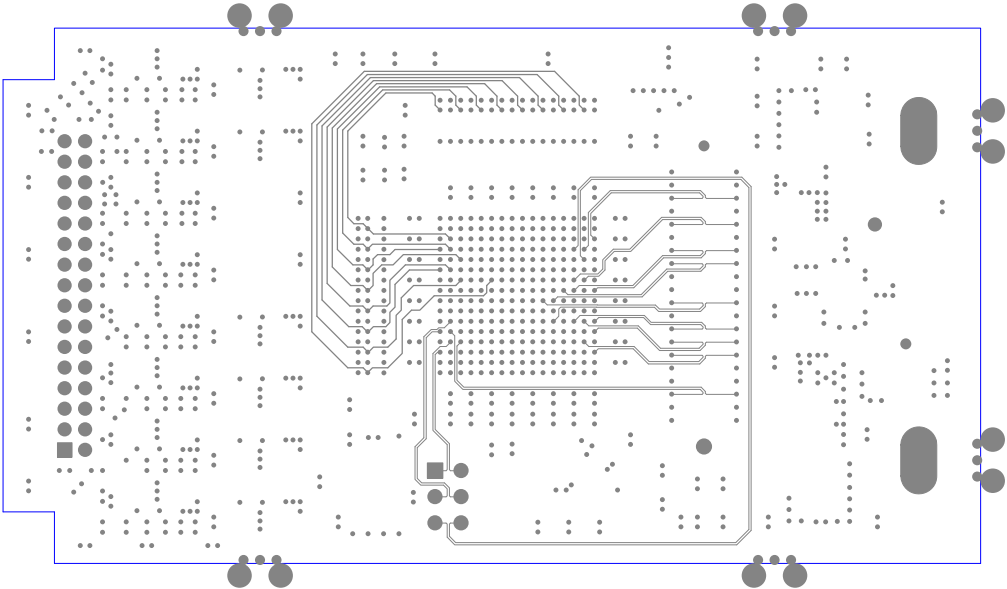
Designer  
M.Traxler

Layouter  
S.Voltz

Layer Nickname

I01

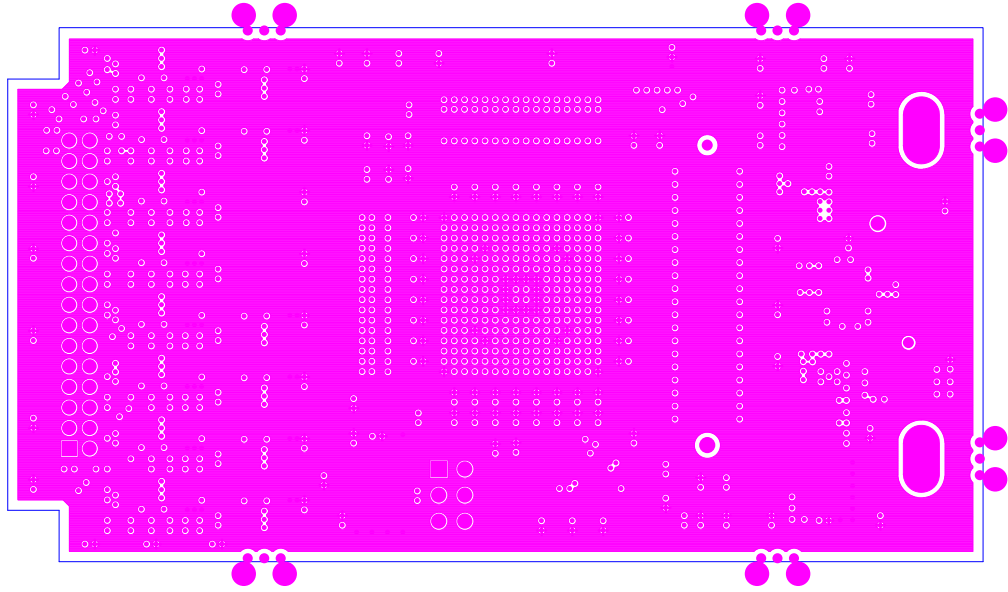
Diff.Pairs



Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname  
I02

# VREG-Plane



Jobname  
PADIWA3

Date  
12.2012

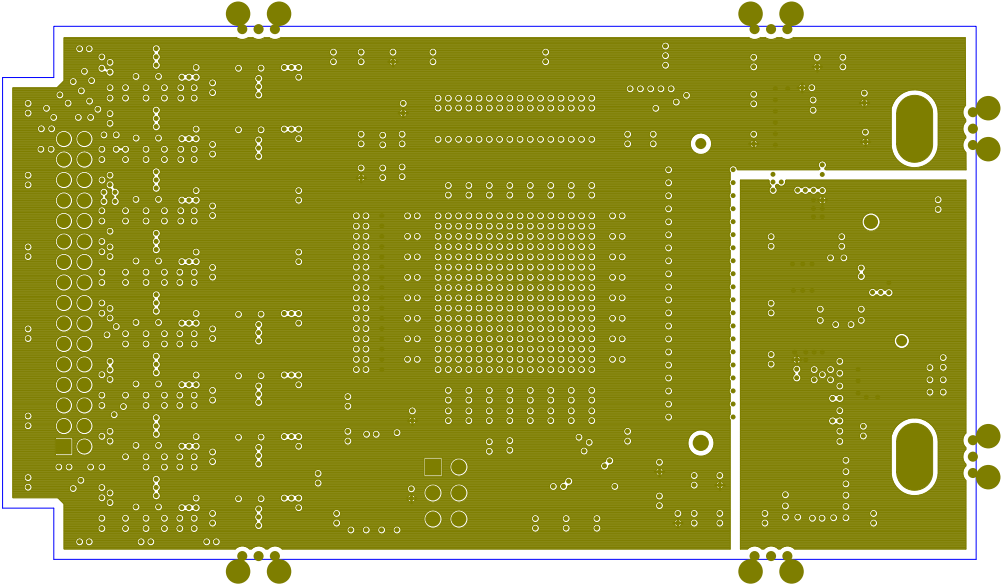
Designer  
M.Traxler

Layouter  
S.Voltz

Layer Nickname

I03

VTERM-Plane, VIN-Plane

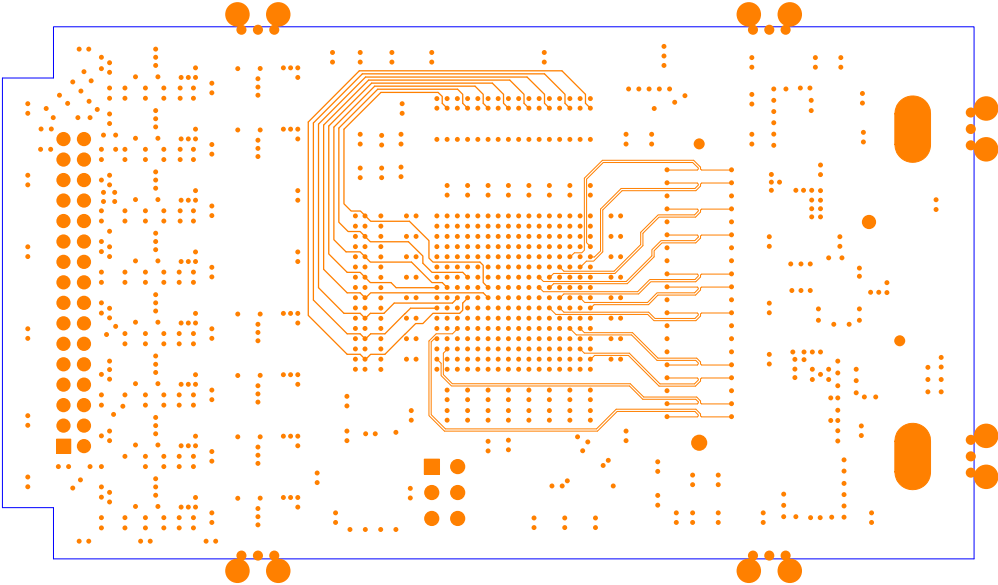


Jobname PADIWA3 Date 12.2012 Designer M.Traxler Layouter S.Voltz

Layer Nickname

I04

Diff.Pairs

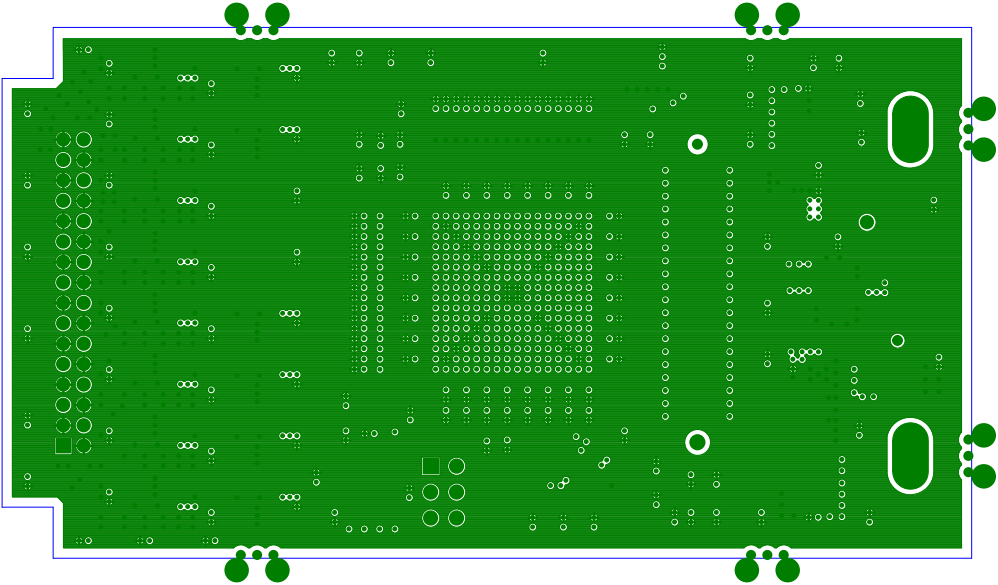


Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname

I05

GND - Plane



Jobname  
PADIWA3

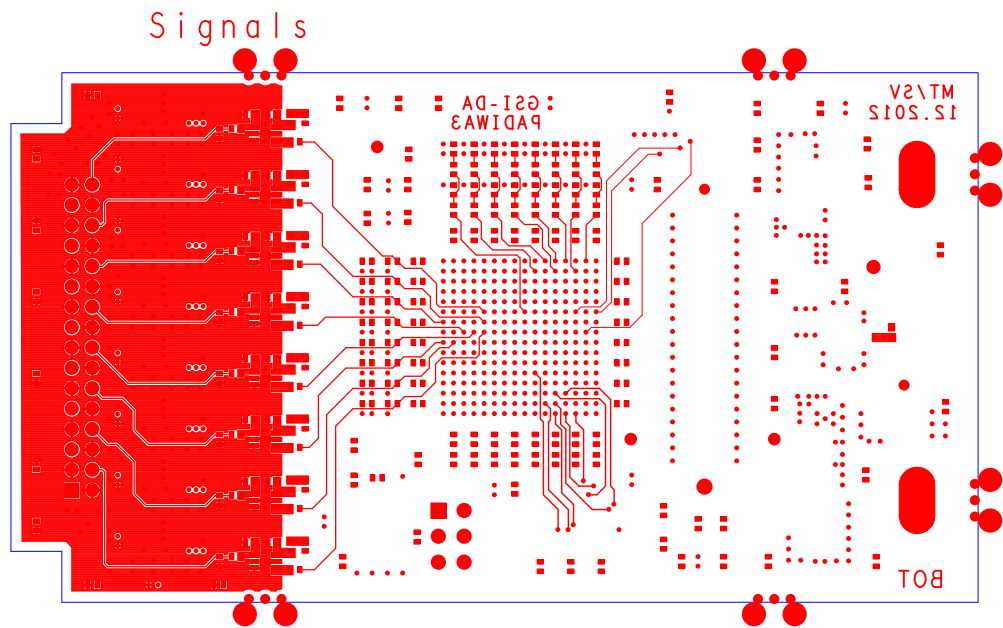
Date  
12.2012

Designer  
M.Traxler

Layouter  
S.Voltz

Layer Nickname







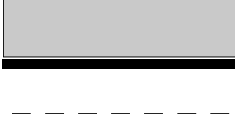


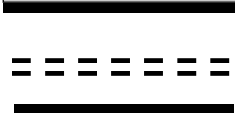



I06



Jobname	Date	Designer	Layouter
PADIWA3	12.2012	M.Traxler	S.Voltz

Layer Nickname

Bot

LAGENAUFBAU (Impedanz)									
8 - Lagen Kern: mm Cu / µm									
WE-Artikel Nr.:					8 - Lagen				
KUNDE:		GSI PADIWA2							
LAGENBEZEICHNUNG		AUFBAU			BASIS-Material	CU	PREPREG ANZAHL/TYP	ENDDICKE	KUNDEN-FORDERUNG
KUNDE	WE							[µm]	[µm]
1	TOP/VS				Folie	9 µm <sup>1)</sup>		9	
							1x 2113	94	
2	2					18 µm		18	
					0,15 mm			150	
3	3					18 µm		18	
							2x 2116	214	
4	4					18 µm		18	
					0,51 mm			510	
5	5					18 µm		18	
							2x 2116	214	
6	6					18 µm		18	
					0,15 mm			150	
7	7					18 µm		18	
							1x 2113	94	
8	BOT/RS				Folie	9 µm		9	
	<b>Imp</b>	Imp.-Lage	LBBR	ISO	ISO z. Masse				
	<b>Zdiff</b>	L3/L6 = 100,10 Ohm	100µm	120µm					
	<b>Zdiffcopl</b>	L3/L6 = 100,30 Ohm	100µm	130µm	150µm				
	<b>Zo</b>	VS/RS =49,30 Ohm	150 µm						1) Kupferenddicke Außenlagen nach IPC (35µm Forderung)
	<b>Zo copl</b>	VS/RS =49,90 Ohm	130µm		150µm				
		Material TG 150 hf							
					Gesamtdicke Material:			1552	
		Anmerkung: Werte für Prepreg sind Mittelwerte (der genaue Wert ist von den Leiterbildstrukturen abhängig)							
<b>MATERIALDICKE:</b>		<b>1,53</b>	+/-	0,16	mm	Index	Datum:	Bearbeiter:	
DICKE über galv. Endoberfläche		1,60	+/-	0,17	mm		05.12.2012	A.Wodke	
DICKE über LSM incl.galv.-Kupfer		1,64	+/-	0,18	mm				
Kundenforderung:			+/-		mm	Messstelle:			
Erstellt am	von	Geprüft am	von	Freigegeben am	von	Revision			
28.09.2006	M.Kress	24.10.2006	S.Baumann	25.10.2006	R.Taurus	00	Seite:	1+	



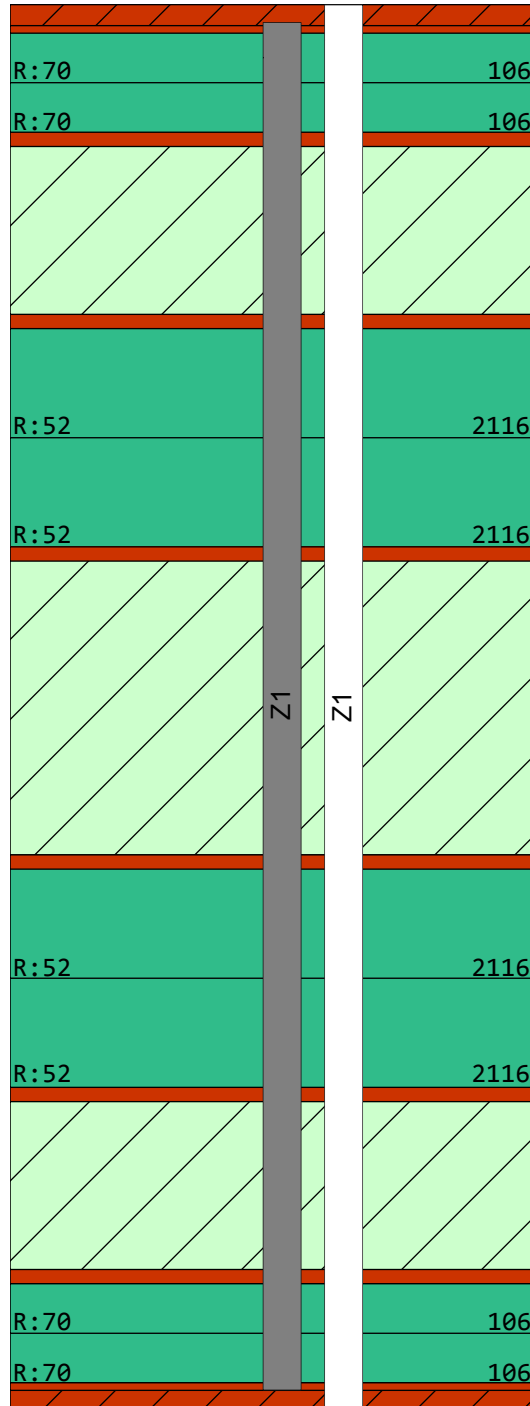
Material (µm)

Stack up

File

Assembly

25 Galvanic Cu  
 9 Copper  
 50 NP-155F-B  
 43 NP-155F-B  
 17 Copper  
 200 NP-155F-TL  
 17 Copper  
 109 NP-155F-B  
 113 NP-155F-B  
 17 Copper  
 350 NP-155F-TL  
 17 Copper  
 113 NP-155F-B  
 109 NP-155F-B  
 17 Copper  
 200 NP-155F-TL  
 17 Copper  
 43 NP-155F-B  
 50 NP-155F-B  
 9 Copper  
 25 Galvanic Cu



BS I

I2

I3 I

I4

I5

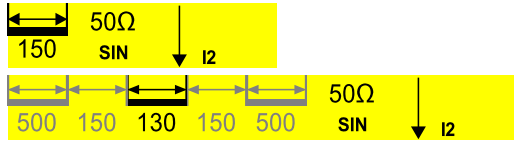
I6 I

I7

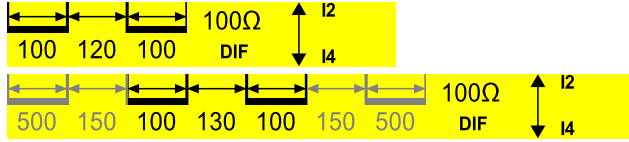
LS I

A1

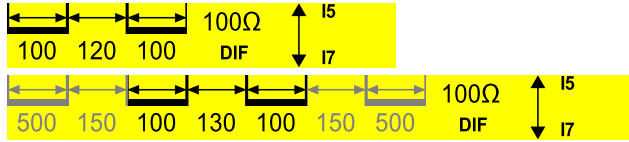
## bs



## i3



## i6



## Is

